

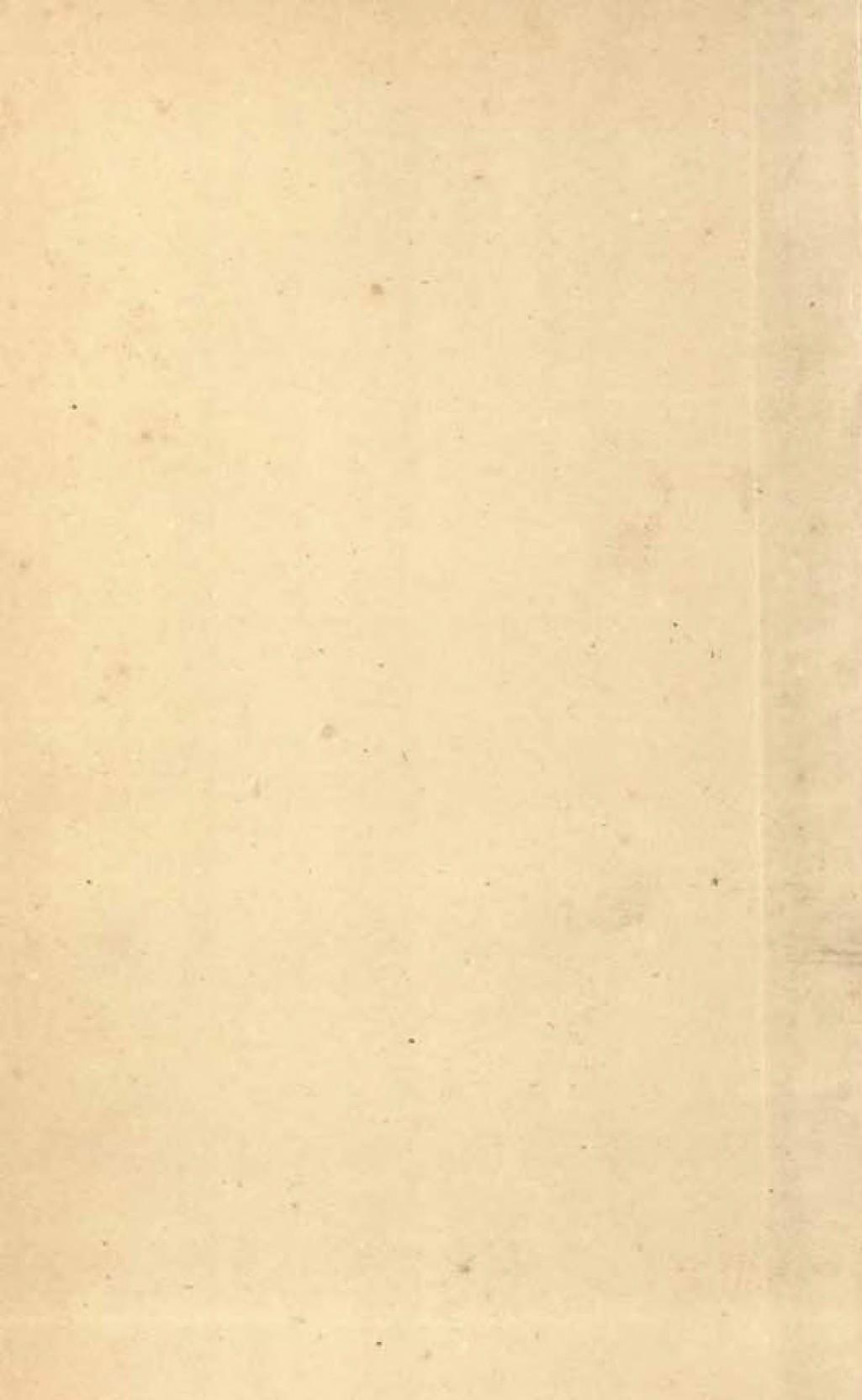
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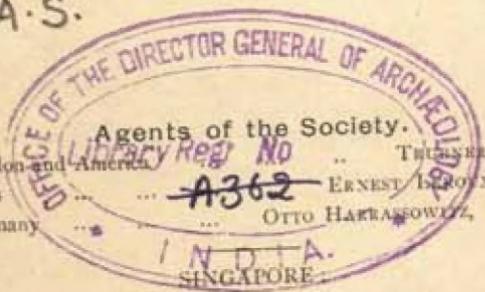
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JOURNAL  
OF THE  
STRAITS BRANCH  
OF THE  
Royal Asiatic Society.

25051

JANUARY 1900.

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THE  
Straits Branch  
OF THE  
ROYAL ASIATIC SOCIETY.

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*COUNCIL FOR 1900.*

The Right Revd. Bishop G. F. HOSE—*President.*

The Hon'ble W. R. COLLYER—*Vice-President for Singapore.*

The Hon'ble Dr. BROWN—*Vice-President for Penang.*

H. N. RIDLEY, Esq.—*Honorary Secretary.*

Dr. HANITSCH—*Honorary Treasurer.*

H. H. ESCHKE, Esq.

The Hon'ble W. J. NAPIER,

R. N. BLAND, Esq.

R. W. HULLETT, Esq.

The Rev. W. G. SHELLABEAR.

*Councillors.*

LIST OF MEMBERS  
FOR  
1900.

ANTHONISZ, J. O., B. A.	Singapore.
BAMPFYLDE, C. A.	Kuching, Sarawak.
BANKS, J. E.	Singapore.
BARKER, Dr. J. K.	Sarawak.
BARNES, W. D.	Kuala Lipis, Pahang
BELFIELD, F.	Taiping, Perak.
BERRINGTON, A. T. D.	Taiping, Perak.
BICKNELL, W. A.	Audit Department, Penang.
BIRCH, J. K.	Penang.
BLAGDEN, C. O., M. A., (Life Member)	England.
BLAND, R. N.	Singapore.
BOTT, Dr. W. N.	
BRADDON, Dr. W. L.	Seremban, N. Sembilan.
BRANDT, D. VON	Stanmore, Singapore.
BROCKMAN, E. L.	Singapore.
BROWN, The Hon. Dr. W. C.	Penang.
BRYANT, A. T.	Ipoh
BRYDGES, E. E. H., M. A.	England.
BUCKLEY, C. B.	Orchard Road, Singapore.
BUTLER, A. L.	Kuala Lumpur.
CAMUS, A.	Taipeng, Perak.
CLIFFORD, H. C.	Sandakan.
COLLYER, The Hon'ble W. R.	Singapore.
CONLAY, W.	Kuantan, Pahang.
COOK, Rev. J. A. B.	Singapore.
DANE, Dr. R.	Province Wellesley.
DENT, SIR ALFRED, K.C.M.G.	11 Old Broad St., London, E. C.
DEW, A. T.	Kuan, Perak.

DICKSON, E. A.	Sepang, Selangor.
DRIVER, JAMES	Kuala Lumpor.
DUNKERLEY, REV. W. H., M.A.	Penang.
DUNLOP, C.	Singapore.
EDMONDS, R. C.	Jugra, Selangor.
EGERTON, WALTER	Malacca.
ESCHKE, H. H.	German Consulate, Singapore.
EVERETT, H. H.	Sarawak.
FLOWER, S. S.	Cairo.
PORT, HUGH	Singapore.
FREER, DR. G. D.	Penang.
GENTLE, ALEX.	Singapore.
GERINI, MAJOR G. S.	Siam.
GRAHAM, JAMES	Glasgow, Scotland.
GROOM, S. R.	Malacca.
HAFFENDEN, JOHN	Singapore.
HAINES, REV. F. W.	Malacca.
HALE, A.	Tampin, N. Sembilan
HANITSCH, DR. R.	Singapore.
HARE, G. T.	Kuala Lumpor.
HAYNES, H. S.	Gantian, B. N. B.
HERVEY, D. F. A., C.M.G. (Hon. Member)	Aldeburgh.
HILL, The Hon. E. C.	Singapore.
HOSE, The Rt. Rev. Bishop G. F., M.A., D.D. (Hon. Member)	Singapore.
HOSE, CHARLES.	Baram, Sarawak.
HOSE, E. S.	Perak.
HOYNCK VAN PAPENDRECHT, P. C.	Singapore.
HULLETT, R. W., M.A., F.L.S.	Singapore.
JOAQUIM, J. P., F.R.G.S.	Singapore.
JOHNSTON, L. A. M.	Malacca.
KEHDING, Dr.	Germany.
KLOSS, C. BODEN	Singapore.
KNIGHT, ARTHUR	Singapore.
KYNNERSLEY, The Hon. C.W.S.	Singapore.
LAWES, Rev. W. G. (Hon. Member)	Port Moresby, New Guinea

LEASK, Dr. J. T.	Singapore.
LEMON, A. H.	Penang.
LEWIS, J. E. H., B. A.	Government Printing Office, Sarawak.
LIM BOON KENG, Hon. Dr.	Singapore.
LUERING, Rev. Dr. H. L. E.	Singapore.
MACHADO, A. D.	Pahang.
MACLAREN, J. W. B.	Singapore.
MASON, J. S.	Matang, Perak.
MCCAUSLAND, C. F.	Selangor.
MELDRUM, DATO J.	Johore.
MEREWETHER, HON E. M.	Singapore.
MICHELL, W. C., B.A.	Singapore.
MILLER, JAMES	Singapore.
MUNSON, Rev. R. W.	Padang, Bencoolen.
NANSON, W., B.A., F.S.G.	Singapore.
NAPIER, The Hon'ble W. J., M.A., B.C.L.	Paterson Road, Singapore.
ORMSBY, G.	Mayo, Ireland.
O'SULLIVAN, A. W. S., B.A.	Penang.
OWEN, J. F.	Port Dickson.
PARR, C. W. C.	Negri Sembilan.
PERHAM, The Ven'ble Archdeacon (Hon. Member.)	England.
PEARS, FRANCIS	Muar.
RIDLEY, H. N., M.A., F.L.S.	Botanic Gardens, Singapore.
ROBERTS, B. G.	Negri Sembilan.
RODGER, J. P.	Kuala Lumpor, Selangor.
ROSTADOS, E.	Johore.
ROWLAND, W. R.	Negri Sembilan.
SARAWAK, H. H. The RAJA of, G.C.M.G. (Honorary Member.)	Kuching, Sarawak.
SARAWAK, H. H. The R. S. C. of, Sarawak.	
SATOW, SIR E. M., K.C.M.G. (Honorary Member.)	Tokyo, Japan.
SAUNDERS, C. J.	Singapoe.
SEAH LIANG SEAH.	Chop "Chin Hin," Singapore.
SEAH SONG SEAH	Chop "Chin Hin," Singapore.
SHELFORD, R.,	Sarawak.

SHELFORD, W. H.	Singapore.
SHELLABEAR, Rev. W. G.	Singapore.
SKEAT, W. W.	Selangor.
SKINNER, A. M., C.M.G.	Canterbury, England.
SMITH, SIR CECIL C., G.C.M.G. (Honorary Member.)	England.
SOHST, S. C.	Singapore.
ST. CLAIR, W. G.	Singapore.
STRINGER, CHARLES	Singapore.
SUGARS, J. C.	Telok Anson, Perak,
SWETTENHAM, The Hon'ble Sir J. A., C.M.G.	Singapore.
THOMAS, O. V.	Penang.
TOLLEMACHE, R. C.	
VAN BENNINGEN VON HELS-	
DINGEN, Dr. R.	Deli.
VERMONT, The Hon'ble J. M. B.	Penang.
WALKER, Lt.Col. R. S. F., C.M.G.	Perak.
WATKINS, A. J. M.	Selangor.
WELLFORD, Dr. T.	Selangor.
WISE, D. H.	Singapore.
WOOD, J. B.	Ulu Pahang.
WOOD, E. G.	Taipeng.
WRAY, L., J.F.	Taipeng, Perak.

Members are requested to inform the Secretary of any change of address or decease of members, in order that the list may be as complete as possible.

All communications concerning the publications of the Society should be addressed to the Secretary: all subscriptions to the Treasurer.

Members may have, on application, forms authorising their Bankers or Agents to pay their subscriptions to the Society regularly each year.

PROCEEDINGS  
OF THE  
**ANNUAL GENERAL MEETING**  
OF THE  
**STRAITS BRANCH**  
**ROYAL ASIATIC SOCIETY,**  
HELD AT THE  
**RAFFLES MUSEUM, SINGAPORE,**  
ON  
*29th JANUARY, 1900.*

— : —  
PRESENT :

Right Reverend BISHOP HOSE, Hon'ble W. R. COLLYER,  
Hon'ble C. W. KYNNESSLEY, Messrs. A. KNIGHT, R. N. BLAND,  
R. W. HULLETT, A. GENTLE, Dr. LEASK, Dr. HANITSCH,  
Rev. W. SHELLABEAR, Rev. J. E. BANKS, and H. N. RIDLEY.

The Minutes of the last Annual General Meeting were read  
and confirmed.

The Annual Report of the Council and the statement of  
accounts were read and on the proposal of the Hon'ble W. R.  
Collyer, seconded by Mr. Hullett, were passed.

The elections of Members during the year were confirmed by the meeting on the proposal of Mr. Hullett, seconded by Dr. Leask.

The officers and council for the present year were then elected, viz :

*President*.—Right Reverend BISHOP HOSE.

*Vice President (Singapore)* Hon'ble W. R. COLLYER.  
" (Penang) DR. BROWN,

*Honorary Secretary*, H. N. RIDLEY.

" *Treasurer*, DR. HANITSCH.

*Councillors*, Hon'ble C. W. KYNNERSLEY, Mr. R. N. BLAND, Rev. W. G. SHELLABEAR, MR. R. W. HULLETT, and H. H. ESCHKE.

ANNUAL REPORT OF THE COUNCIL  
OF THE  
Straits Branch of the Royal Asiatic Society,  
FOR THE YEAR 1899.

In presenting this Report, the Council are pleased to state that the affairs of the Society are financially more satisfactory than ever.

Since the last General Meeting the following new Members were elected, subject to the confirmation of the General Meeting.

REV. J. A. B. COOK.	MR. FRANCIS PEARS.
MR. J. C. SUGARS.	REV. F. W. HAINES.
MR. R. C. EDMONDS.	DR. A. B. BARKER.

The Council regret to have to record the loss by death of Sir Charles Bullen Mitchell, Patron of the Society, Dr. de Vioq, (Councillor) and Mr. Koe.

The new map was received at the commencement of the year and was in much demand, one hundred and forty copies being sold in Singapore, and one hundred and twenty nine in England. Copies were presented to the Sultan of Johore, and to Prince Devawongse, who had materially assisted in its publication. One Journal, (No. 32) was published during the year, and another in the course of printing will be shortly in the hands of the Members.

A large number of books, pamphlets and journals were presented to the Society or received in exchange from kindred Institutions.

Honorary Treasurer's Cash Account, for the year ending 31st December, 1899.

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	\$	c.	\$	c.
To Balance in Chartered Bank				
" Do. Mercantile Bank	1337	50	1899	
" Subscriptions for 1896	249	76	By American Mission Press for printing of Journal	
" do. " 1897	10	00	No. 32 " " "	432
" do. " 1898	10	00	" Ed. Stanford for printing	
" do. " 1899	55	00	" new maps " "	1010
" do. " 1900	365	00	" Bookbinder (mounting of	
" Life Members	20	00	mars. \$237.30; binding	
" Sale of Journals	100	00	of books, \$217.577 " "	454
" Sale of Maps	157	59	Advertisements " "	17
" Interest on Cash Balance,	1588	67	Furniture " "	10
Mercantile Bank	47		Commission to collector " "	00
"			Clerk's Salary " "	60
"			Petties and Postage " "	48
"			Fixed Deposit (Mercantile	
"			Bank) " "	1600
"			Balance in Chartered Bank " "	309
"			do. Mercantile Bank " "	514
				88
				338.87
				99

Audited and found correct.

12 HANDBOOK

H. N. HLAND.

Honorary Treasurer, Straits Branch, Royal Asiatic Society



## A Trip to Mt. Penrissen, Sarawak.

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At midday on the 5th of May of this present year of grace, Mr. E. A. W. Cox, of the Sarawak Government service, and myself left Kuching for the upper waters of the Sarawak river on a long talked-of collecting expedition. Our ultimate destination was Penrissen, a mountain of 4,800 feet high, five miles from the "ulu" of the left hand branch of the Sarawak river, and about fifty miles as the crow flies from the sea-coast. The mountain had previously been scaled, in part at least, by Signor Beccari, Mr. A. H. Everett, Dr. G. D. Haviland and Mr. Henlerson, but had never, from a zoological point of view, been thoroughly collected over, so that our hopes of obtaining interesting and valuable results ran high.

Our staff consisted of five Dyak collectors, Malay and Chinese boys, and a Chinese cook; to convey these, ourselves and our somewhat bulky baggage, three boats were requisitioned, but as events turned out proved insufficient; however the start was fair and through the lower reaches of the river all went well and comfortably. The night was spent in part at the little village of Selobang, but to catch the tide and to avoid the din of a neighbouring Chinese "wayang," we re-embarked at 12 p.m. and proceeded quietly on our way till at 6.30 in the morning the first "karungan" or gravel bed was encountered; here we stopped for breakfast and a delightful bathe in the now somewhat rapid river. At 9 we were on again, and soon began to experience some difficulty in progression. The river abounded with shallows and small rapids; up and over these our heavy and heavily-laden boats, which to use a Malay expression "ate much water," were poled and hauled only with the greatest difficulty and exertion. At the very bad places a general halt had always to be called, whilst the respective crews joined forces and hauled with ropes one boat up at a time. Late in the afternoon we finally won to Segu, and right glad were we to partake of the

hospitality offered to us by the gentlemen then in charge of the Government coffee-estate at that place. Profiting by our experience we exchanged next day one of our heavy boats with its Malay crew for two lighter boats with crews of Land-Dyaks; these men are experts in the art of poling up against a strong and shallow stream and the women are not far behind the men. It was amusing to hear our new recruits coaching our Malay crews, the latter though secretly acknowledging the superiority of their advisers as polers were too proud to take advice in any form from those they considered in every other respect beneath their notice. With such valuable additions to our forces we proceeded up stream at a fair pace; the scenery was lovely, precipitous walls of limestone carved by the weather into every imaginable shape, rose high on either side. Their summits were clothed with a dense growth of trees and creepers, which in places almost roofed in the narrow channel up which we moved; the river itself here rippling over shallows or dashing through rocky gateways, there running calm and still under an overhanging cliff, ever added fresh beauty and interest to the scene. At night we tied up opposite the village of Burgor, and slept in the boats; an early start was made next morning and by mid-day, we arrived at Pankalan Ampat, thus completing the first stage of our journey. From here we dispatched messengers to the neighbouring village of Sennah, and in the evening had a visit from the Pengara and his youthful son. Thanks to a formidable looking "surat" from the Resident of Sarawak, we met with little difficulty in arranging the important matter of carriers, and were able next day to dispatch the heavy baggage to Sennah, following leisurely ourselves by river, preferring this to the dangers of a Land Dyak road with its picturesque though fragile bamboo bridges slung over nasty-looking places where a fall meant a broken bone or two.

On arrival at Sennah we were met with a cordial welcome by the Orang Kaya and conducted to the chief house of the village. This, as is usual amongst the Land Dyaks, consisted of four or five big houses all built up on tall piles at the summit of the most precipitous part of the river bank. The approach to the village consisted of notched logs, with or without a frail hand-rail of bamboo; communication between one house and

another is established by logs rounded or slightly flattened, generally as slippery as glass; in fact within the village itself no one ever walks on the ground. Beneath the houses pigs root and grunt, fowls cackle and boys fight in a sodden mass of filth, the effluvium from which percolates freely through the open spaces between the floors of bamboo laths. The particular house in which we temporarily took up our abode was a well-built plank structure with bilian attap roof, two large doors led out on to a spacious verandah at the back, which again gave on to a large open space surrounded by fowl-houses and sheds, and with ways leading off to other houses. Here and in the verandah much of the daily work is gone through, the house itself being reserved for cooking, eating and sleeping. In the verandah were a couple of large bell-shaped wooden vessels, half-filled with padi, and nearly all day long women were husking this by repeated thumpings blows administered by 3 or 4 foot poles; when husked, the padi is thrown into circular sieves of *rotan*, and shaken till the husks and broken grain are separated off. The Land Dyak man presents in his dress no particular feature of interest, a blue or red cloth "chawat," or a pair of Chinese trousers and a head handkerchief generally completing his garb. The women however are more picturesque; their sole garment is a short petticoat reaching to the knees, generally of blue cloth with a red border, but their arms from elbow to wrist and their legs from just below the knee to the ankle are encircled by rows of brass rings; a shell armlet and leglet generally topping each series of rings; even the little girls are burdened with these ornaments, though otherwise innocent of clothing, and when a number of girls of different ages are seen together it is quite possible to trace a gradual distortion of the calf of the leg due to the weight of metal borne; generally also several rings of *rotan* dyed red or black are worn round the waist, and out-of-doors a neat close-fitting cap made of palm leaf. There were few objects of ethnographical interest to be noticed in the house. Unlike the Sea Dyak, these people neither weave their cloth, forge their weapons nor make their pottery, but buy such necessaries from Malay and Chinese traders. However, I saw, coveted and subsequently purchased a curious

hat known as "Bok tumbis;" this was cylindrical, narrower at the top than at the bottom, 9 inches in height, made of coloured beads strung in striking patterns on five threads of *rotan*, the whole strengthened with uprights of thicker *rotan*. The top was open, and through the aperture the wearer—always a woman—pulls her hair, allowing it to stream out on all sides, it is only worn in dances during the annual harvest feast; the men on such occasions sometimes wear a necklace of tiger-cat's teeth alternated with the teeth of bats, squirrels and such like small deer. Besides elegantly-carved wooden handles for their *parangs*, baskets woven from *rotan*, without any distinctive pattern, and small oval wooden boxes for powder and shot, I could discover no other article which these people make.

That evening we held a great "bichara," and after overriding the almost countless objections to carry our baggage raised by one man after another, we endeavoured to get information concerning the summit of the mountain, its conformation, the water-supply, the animals and birds, and such like matters; many yarns were spun to us, and we received a large amount of information which subsequently proved to be mainly erroneous. Though Penrissen is the hunting ground of these Sennahs, but few had ascended to any considerable altitude, so they compensated for their lack of the knowledge we wanted by unlimited romancing. Though we rose early next morning, it was nine o'clock before we could make a start on our march to the mountain; our thirty to forty coolies wanted to take only the lightest loads, whilst we naturally wanted them to take those things which we needed most, leaving the rest to follow with further detachments of coolies from outlying villages, and the apportioning of weights was a long task. At length we made a move, and after wading across the river began our tramp. The way lay through old deserted padi farms overgrown with a dense but scrubby jungle; the country was undulating in the extreme, and the path the merest track, a foot or less in breadth, at frequent intervals interrupted by bamboo bridges and batangs, for the most part rotten. As the heat was intense we found walking very trying and difficult, and were glad at twelve o'clock to rest and discuss a meal. At one o'clock we were on again, and soon reached the lower slopes of the

mountain, and as these up to a height of 2,000 feet are clothed with bamboo jungle, we found the going much more easy. After crossing several mountain torrents, we reached late in the afternoon, at an altitude of 2,500 feet, a huge overhanging boulder of sandstone conglomerate, known to the Sennahs as Batu Tinong, and under this we pitched our camp for the night. A dashing mountain stream was quite close by, and the delight of sitting under a foaming cascade of really cold water after our exhausting day was one not readily to be forgotten. Leeches had proved persistent and troublesome throughout the day, but in my opinion the annoyance caused by them has always been somewhat exaggerated.

Next morning we continued our climb until we had reached an altitude of 3,400 feet, when our guides called a final halt : the position was not particularly inviting, being a very small flat area totally shut in by tall jungle, whilst both to the front and rear the sides of the mountain sloped steeply downwards and upwards ; however, as we were informed that there was no water to be had at any greater height, and further that all the Europeans who had previously visited the mountain had encamped here, we had perforce to acquiesce in our guides' decision. Our carriers made a clearing and proceeded to build us a hut ; this took two or three hours to complete, as we insisted it should be commodious, solid and watertight ; the poles and beams were of course felled in the jungle, and the floor, raised about two feet off the ground, was made with laths and saplings, whilst intertwined palm-leaves served for roof and walls. Every felled tree produced a small harvest of insects ; a few interesting butterflies invaded the clearing, amongst them *Cyrestis seminigra*, previously only recorded from Kian Balu, whilst in the undergrowth were found snails, scorpions and centipedes, all delightfully unfamiliar to the low-country naturalist. In securing these specimens and in rigging up shelves and sleeping-bunks in our hut, making all comfortable and snug, we spent the rest of the day.

On the following day (May 13th) Mr. Cox early started out to explore the mountain at a higher elevation, and at mid-day returned with the report that after a stiff climb of 400 feet, he had reached a magnificent plateau of considerable extent,

where water was abundant and a good view readily obtainable, altogether infinitely superior to our present situation; our chagrin at having been deceived by our guides was great, but we decided to wait till the shooters returned from the jungle round about, whither they had early that morning been sent, before deciding whether it was worth while or not staying on in our present position. When eventually the hunters returned, the results of their labours were not very interesting, except the insects; of birds, a small robin-like species, dull in colour (*Alcippe cinerea*) was the only one at all characteristic of a mountain ornith. Mr. Cox therefore decided to visit next day the actual summit of the mountain, and if much of interest was seen or procured, to stay there for 10 days or a week. In accordance with this idea he and all the collectors, except one, whose services I retained, departed on the 14th. At mid-day I received word that they had reached the actual summit. Up to 4,500 feet the climbing had not been particularly difficult, but the last 300 feet was a sheer precipice of sand-stone conglomerate with a few narrow ledges at infrequent intervals, and to scale this, ladders had to be improvised; the summit was found to be quite flat, about half a mile long by two hundred yards broad, a dreary wilderness of pandanus and *rotan*, with hundreds of huge trees in every stage of life, from full and vigorous growth to absolute decay. Animal life was very scarce, and as a strong wind was blowing, bringing up a dense fog, Mr. Cox decided to descend to the foot of the cliff and encamp there. By the bearers of his message he sent down a specimen of the trogon, *Harpactes dulitensis*, and a gigantic earthworm nearly eighteen inches long.

During the next five days I collected assiduously round about our hut and on the plateau already alluded to, dismissed our first batch of coolies and awaited the arrival of the rest of our baggage. This came up by degrees, until finally all our belongings could be bestowed in our hut and kitchen.

On the 18th, Mr. Cox sent down to say that he had moved lower down the mountain on to a peak known as Mt. Prang, altitude 3,900 feet, and as some most curious insect larvae (*Vermileo sp.*) accompanied his letter, I determined to join him and investigate the life-history of the insect as fully as possi-

ble. At this station the hunters had erected a long lean-to on the side of the hill, and from it we had a most magnificent view of the country below us right down to the sea, fifty miles away. Unfortunately at this altitude our view was too frequently interrupted by fog and cloud, which generally swept up towards the middle of the day, and obscured everything till nightfall. From this station we made various expeditions round and about. Birds and mammals were extremely scarce, and the insects did not differ very markedly from those to be caught on the plateau; as, moreover, I had obtained alive several specimens of the fly-larva, *Vermieo* sp (?) \* we decided to return to our original and comfortable quarters.

We descended on the 24th, and from then till the 30th lived a calm and uneventful life; our mornings from an early hour to nearly noon were spent in tramping through the jungle, hunting for birds, reptiles, insects, in fact, everything that had life in it; the afternoons in skinning, pinning out insects, bottling and labelling spirit specimens, and the other thousand and one duties which make a collector's life a busy one. An early dinner with bed to follow completed the day.

The return journey to Sennah was much like the first, save that it was accomplished in one day, one little incident only perhaps is worthy of note:—as we neared the foot of the mountain our carriers suddenly espied a small tree, which to our eyes presented no particular features of interest; however, loads were thrown aside in a hurry and a rush made for the tree, which was quickly hacked down and split up, and from numberless burrows in the wood, hundreds of a peculiarly scented, pinkish larva were extracted. No adults or pupae were to be found, so beyond recognising the larva as that of a beetle, I was unable to determine the species or even family: these larvae when boiled are considered a great delicacy by the natives of the district. They certainly looked much more appetising than the fat white grubs of the big coconut beetle which these people also devour with great gusto.

From Sennah we proceeded straight on to Pankalan Ampat, and after waiting a few days for boats and to collect

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\* See this Journal for description of the habits of this curious larva.

revenue we returned to Kuching, arriving on June 4th.

Taken as a whole, the expedition was a great success, but the very great scarcity of mammals and birds was disappointing; only two kinds of monkey were seen. The cry of a solitary Wa-Wa was heard, but occasionally; pigs, deer, *kijang* and *pelandok* were noticeable only by their absence, and not a single game bird was procured or even seen. This scarcity I attribute to the fact that 60 per cent of the Dyaks of a by no means thinly populated district are armed with guns, which they constantly use, huge foraging parties going out before every harvest feast and keeping up for days a constant fusillade on anything above the size of a thrush; further I am inclined to suspect that this the Southern end of Sarawak is less faunistically rich than the more Northern regions. Certainly the list of birds which we obtained on Penrissen must compare somewhat unfavourably with those published by the late Mr. John Whitehead and by Mr. Charles Hose of Baram, two gentlemen whose labours on Mts. Kina Balu and Dulit are so well known in the zoological world.

Reptiles and amphibia were moderately abundant, and three species of fish were captured in a mountain stream by the use of *Tuba*. The invertebrate fauna was extremely rich, and much attention was paid to forming large collections of insects, and arthropods in general, and I am confident that, entomologically at least, no mountain in Borneo has been so well worked at as was Penrissen during our stay there.

Very little time was at our disposal to collect satisfactorily the flora of the mountain; the small collections made, however, have proved to be of such interest (see Appendix to the article) that I have determined to send back my collectors to the mountain in October, almost entirely to botanise.

Lists of the animals obtained will appear from time to time in this Journal in the order in which they are worked out. At present I am indebted to Mr. Ridley for working out the plants (Phanerogams only) obtained, and to His Lordship the Bishop of Singapore and Sarawak for the appended list of, and remarks on, the ferns.

R. Shelford.

## APPENDIX I.

### List of the Mammals of Penrisson.

1. *Hylobates leuciscus* Schreb. No specimen of this was captured.
2. *Semnopithecus rubicundus* Müll. Extremely common, not differing in any way from low-country specimens.
3. *Macacus cynomolgus* L. Two specimens were shot near the summit of the mountain, and were remarkable for the great length of the hair round the face.
4. *Hippopoterus* sp. (?) This is perhaps a new species, a matter to be decided by Mr. Oldfield Thomas, of the British Museum.
5. *Tupaia* sp. (?) Closely mimicked by *Sciurus everetti*. The species may possibly be *T. mälteri*, described lately by Kohlbrugge.
6. *Tupaia minor* Gthr.
7. *Ursus malayanus* Raffles. A large specimen of this bear was encountered as we were on our way down the mountain and, as guns were not handy, the animal made good his escape before a shot could be fired.
8. *Paradoxurus hermaphroditus* Schreb. This and the following two species are about the only mammals which the Land Dyaks do not eat.
9. *Arctictes binturong* Raffles. Native name "tün."
10. *Herpestes brachyurus* Gray.
11. *Sciurus (Ratufa) bicolor ephippium* Müll. Somewhat to my surprise this squirrel was exactly the same as the variety obtained round Kuching. It is a species which varies

## 10 LIST OF THE MAMMALS OF PENRISSEN.

most markedly in different localities, mountain forms being as a rule much darker and redder.

12. *Sciurus hippocatus* Geoff.
13. *Sciurus tenuis* Horsf.
14. *Sciurus (Funambulus) everetti* Thos.
15. *Nannosciurus melanotis* Müll. and Schleg.
16. *Mus margaretae* Thos. This pretty little mouse was seen about the house one evening, but it eluded all efforts to catch it.
17. *Sus barbatus* Müll.
18. *Cervus equinus* Cuv.

### The Birds of Mount PenrisSEN and Neighbouring District.

The bird fauna of Mount PenrisSEN as evinced by collections made in the month of May of this year (1899) has proved to be most disappointingly sparse, and this list must compare somewhat unfavourably with those of the late Mr. Whitehead's collections on Mt. Kina Balu and of Mr. C. Hose's collections on Mt. Dulit. Not only was the number of species obtained small, but bird-life in general, with the exception of Barbets, was most noticeably scarce. I attribute this scarcity partly to the fact that the mountain has long been the happy hunting-ground of the Land Dyaks, 60 % of whom are armed with guns; all the game birds seem to have been shot or trapped, for we certainly neither saw nor heard one, whilst hornbills, profiting by a large experience of the sound of a shot, were very difficult to approach. A good collection of low-country birds was made at Pankalan Ampat, at the head of the left-hand branch of the Sarawak river, and about 10 miles from the foot of PenrisSEN. Amongst other good things we were fortunate enough to obtain there, was a specimen of a kingfisher, rare in Borneo, *Alcedo erythroneura*.

With the exception of a small fly-catcher, too battered for description, and an obscure little greenish Timeling, allied to

*Melanis*, all the species obtained are well known, thanks chiefly to the labours of Mr. Hose on Mt. Dulit. As each of the above-mentioned specimens are unique, and as my knowledge of systematic ornithology is somewhat inadequate, I refrain from describing them, until further material can be obtained. I have followed the classification adopted by Mr. Everett in his list of Bornean birds (cf. this Journal No. 20, 1889,) and I have included those species obtained by Mr. Everett in a former expedition to Penrissen.

## FAMILY TURDIDÆ.

1. *Myiohoneus borneensis* Sclater, Ibis 1885, p. 123. One young specimen of this species was obtained, differing so markedly from the adult, that I was inclined to regard it as a new species; a subsequent careful comparison with a skin of a typical female from Mt. Dulit revealed its identity. The back wings and tail are of a very dark brown, and the feathers of the breast and head have the shafts and tips white, the webs of these feathers are not so well developed as in the adult, and there is no trace of any blue coloration on the wings. Feet purple. 4,100 feet.
2. *Copsychus saularis* L. Sharpe, Cat. B. vii. p. 65. Common everywhere in the low-country.
3. *Uttocincla suavis* Sclater. Sharpe, Cat. B. vii. p. 87. From Paukalan Ampat.
4. *Pomatorhinus borneensis* Cat. Sharpe. Cat. B. vii. p. 411. Low-country and up to 3,000 feet.
5. *Stachyris leucotis* Sharpe. Ibis 1878, p. 418. Penrissem 3,000 feet.
6. *Stachyris borneensis* Sharpe. Ibis 1887, p. 449. A common species on Penrissem. A nest with three eggs was found, the eggs are white (as is usual in this genus) and measure 21 by 16 mm.: the nest is a loose ill-made structure.
7. *Malacopterum albogulare* Gray. Sharpe, Cat. B. vii. p. 568.

This species is eminently characteristic of the western end of Sarawak. Pankalan Ampat.

8. *Alcippe cinerea* Blyth. Sharpe, Cat. B. vii. p. 622. The commonest species on the mountain: the note is like that of a robin.
9. *Staphidae eceretti* Sharpe. Ibis 1887. p. 447. Pankalan Ampat. The nest is neatly woven from vegetable fibres: the eggs are white with small brown spots, more thickly placed at the upper end.
10. *Turdinus sepiarius* Horsf. Sharpe, Cat. B. vii. p. 511. Penrissem from 2000 feet upwards. We did not find the typical mountain form *T. canicollus* Sharpe recorded from Dulit and Kina Balu.
11. *Trichostoma rostratum* Blyth. Sharpe, Cat. B. vii. p. 562. Pankalan Ampat. Not at all common.
12. *Drymocichla capistratoides* Temm. Sharpe, Cat. B. vii. p. 555. Pankalan Ampat.
13. *Kenopia striata* Blyth. Sharpe, Cat. B. vii. p. 578. Lower slopes of Penrissem.
14. *Turdinus exsul*. Sharpe, Ibis 1888, p. 479. Penrissem (A. H. Everett).

#### FAM. BRACHYPODIDÆ.

15. *Hemixus malaccensis* Blyth. Sharpe, Cat. B. vi. p. 52. Found all over the mountain.
16. *Hemixus connectens* Sharpe. Ibis 1887, p. 446. This was one of the commonest species of this family on the mountain. The Dyak name "empulu" is applied to all birds of this species.
17. *Pinarochroa euphrosa*. Sharpe, Cat. B. vi. p. 62. Pankalan Ampat and Penrissem.
18. *Criniger diardi* Temm. Sharpe, Cat. B. vi. p. 76. A characteristically low-country form, common everywhere.

19. *Criniger ruficrissus* Sharpe. Id. Cat. B. vi. p. 81. Another common mountain "empulu."
20. *Criniger gutturalis* Bp. Sharpe. Cat. B. vi. p. 80. Penrissem and Pankalan Ampat.
21. *Criniger fluechi* Salvad. Sharpe, Cat. B. vi. p. 84. Pankalan Ampat. This is generally found on mountains, and it was with some surprise that I obtained it at so low an altitude.
22. *Tricholestes criniger* Blyth. Sharpe, Cat. B. vi. p. 80. Pankalan Ampat.
23. *Trachycomus ochrocephalus* Gm. Sharpe, Cat. B. vi. p. 93. Pankalan Ampat.
24. *Pycnonotus simplex* Less. Sharpe, Cat. B. vi. p. 153. Pankalan Ampat.
25. *Rubigula webberi* Hume. Sharpe, Cat. B. vi. p. 171. Pankalan Ampat. We did not meet with this pretty little bird on Penrissem, where Mr. Everett formerly obtained it.
26. *Aegithina viridissima* Sharpe. Cat. B. vi. p. 6. A very common low-country bird along the banks of rivers in their upper waters. One specimen was shot on Penrissem at an altitude of 3,000 feet. *Actiphia viridis* Bp. is common round Kuching and near the coast.
27. *Chloropsis zosterops* Vig. Sharpe, Cat. B. vi. p. 24. Pankalan Ampat.
28. *Chloropsis cyanopogon* Temm. Sharpe, Cat. B. vi. p. 32. Pankalan Ampat.
29. *Chloropsis viridipectus* Sharpe. Id. Cat. B. vi. p. 31. pl. Pankalan Ampat.

## FAM. ORIOLIDÆ.

30. *Oriolus xanthorotus* Horsf. Sharpe, Cat. B. iii. p. 213. Penrissem. The only species of Oriole to be found on the

mountain, a most disappointing fact as I had great expectations of obtaining some typically mountain form.

31. *Dissemurus paradiseus* L. Sharpe, Cat. B. iii. p. 258. Ranges up to 3000 feet.

FAM. MUSCICAPIDÆ.

32. *Erythromyias mulleri* Blyth. Sharpe, Cat. B. iv. p. 200 pl. iv. f. 2. Penrissen (A. H. Everett).

33. *Erythromyias* sp. n. (?)

One badly shot specimen of a little fly-catcher belonging to this genus was obtained: it was quite impossible to sex the bird and it would be unwise to describe it until further material is obtained. The plumage of the upper parts and wings are as in *E. mulleri*, but the breast is ashy and the lower halves of the outer tail-feathers are white. Penrissen 4,100 feet.

34. *Rhipidura perlata* S. Mull. Sharp, Cat. B. iv. p. 328. Common up to 3000 feet.

35. *Tersiphone affinis* Blyth. Sharp, Cat. B. iv. p. 349. Low country and up to 3000 feet. Known as the "rain-bird" by the natives.

36. *Philentoma velatum* Temm. Sharpe, Cat. B. iv. p. 365. Ranges up to 4000 feet. The young male resembles the adult females very closely, but the plumage on the abdomen and rump is generally admixed with earthy brown.

37. *Philentoma pyrrhoptera* Temm. Sharpe, Cat. B. iv. p. 366. Occurs side by side with the preceding species; both are easily called up to the gun. Mr. E. Bartlett former curator of the Sarawak Museum described in this Journal (April 1894) a new species of *Philentoma*, *P. maxwelli*. I have examined the solitary specimen in the Museum collection and have very grave doubts of its distinctness from *P. pyrrhoptera*; a quite asymmetrical patch of chestnut on the breast is the only distinguishing feature, and prefer to regard the bird merely as a some-

what abnormal variation, until further material is obtained; but as seven years have elapsed since the specimen was shot and more or less continuous collecting in the same area has not brought to light a similar one, though both *pyrrhopterum* and *relatum* are common enough, I hold no very strong hopes of matching the specimen with another.

38. *Culicicapa ceylonensis* Swains. Sharpe, Cat. B. iv. p. 369.  
Penrissen and surrounding low-country.
39. *Siphia beccariana* Salvad. Sharpe, Cat. B. iv. p. 452. Penrissen 4,000 feet.
40. *Siphia (?) everetti* Sharpe, Ibis. 1890, p. 366. Penrissen 4000 feet.  
I am not at all certain that I have identified this species correctly; its nearest ally seems to be *Stoparola panayensis* Sharpe from the Philippines, judging from a description of that species, the distinction between the genera *Stoparola* and *Siphia* is a very small one, merely a question of the proportion of culmen-length to breadth at the gape.

#### FAM. NECTARINIIDE.

41. *Ethopyga temmincki* S. Mull. Gadow, Cat. B. ix. p. 16.  
Not uncommon on Penrissen above 3500 feet.
42. *Anthothreptes simplex* S. Mull. Gadow, Cat. B. ix. p. 114.  
Penrissen.
43. *Anthothreptes malaccensis* Scop. Gadow, Cat. B. ix. p. 122.  
Pankalan Ampat. This species was not found on the mountain.
44. *Arachnothera flavigaster* Eyton. Gadow, Cat. B. ix. p. 109.  
Penrissen up to 4000 feet.
45. *Arachnothera longirostris* Lath. Gadow, Cat. B. ix. p. 103.  
Penrissen and Pankalan Ampat.  
The nest composed of leaves is fastened to the under side of a leaf, two or three eggs are laid, often showing a

considerable amount of variation in their colouring ; the most typical form is white with a suffused brown band circling the egg about its middle.

FAM. DICEIDÆ.

46. *Prionochilus xanthopygius* Salvad. Sharpe, Cat. B. x. p. 66. Penrissem 4000 feet.  
 47. *Prionochilus maculatus* Temm. Pankalan Ampat. Sharpe, Cat. B. x. p. 69. Pankalan.

FAM. MELIPHAGIDÆ.

48. *Zosterops aureicenter* Hume. Gadow, Cat. B. M. vol. ix. p. 163. Penrissem (A. H. Everett).  
 49. *Zosterops squamifrons* Sharpe, Ibis. 1892, p. 323. Penrissem (A. H. Everett).

FAM. STURNIDÆ.

50. *Calornis chalybea* Horst. Sharpe, Cat. B. xiii. p. 143. Penrissem and Pankalan Ampat.

FAM. CORVIDÆ.

51. *Corvus macrorhynchos* Wagler. Sharpe, Cat. B. iii. p. 39. The crow was met with at considerable elevations.  
 52. *Platysophus coronatus* Raffl. Sharpe, Cat. B. iii. p. 318. Penrissem up to 2500 feet.

FAM. PITTIIDÆ.

53. *Pitta arcuata* Gould. Scl., Cat. B. xiv. p. 431. Penrissem up to 4000 feet.  
 This was the only Pitta to be found on the mountain and its melancholy whistle was constantly heard. The nest is the usual loose bundle of leaves and grass characteristic of the members of this family and the eggs are white, spotted with grey and brown in an irregular band above the middle ; they measure 30 by 22 mm.

## FAM. EURYLÆMIDÆ.

54. *Calyptomena viridis* Raffl. Sel., Cat. B. xiv. p. 456. Pankalan Ampat; the mountain forms *C. Whiteheadi* Sharpe and *C. klossii* Sharpe were not found.
55. *Eurylæmus ochromelas* Raffl. Sel., Cat. B. xiv. p. 465. Common in the low-country.
56. *Cymborhynchus macrorhynchos* Gm. Sel., Cat. B. xiv. p. 468. Pankalan Ampat.

## FAM. CYPSELIDÆ.

57. *Collocalia fusciphaga*, (?) Thunb. Hartert, Cat. B. xvi. p. 498. Numerous swifts, probably of this species, were seen just below the summit of the mountain. None were procured, however.

## FAM. PICIDÆ.

58. *Sasia abnormis* Temm. Hargitt, Cat. B. xviii. p. 557. Pankalan Ampat. An omen bird of the Dyaks.
59. *Chrysocolaptes validus* Temm. Hargitt, Cat. B. xviii. p. 458. A pair of this handsome woodpecker was shot on Mt. Seruru, a spur of Mt. Penrisen at an altitude of 4,300 feet.
60. *Chrysophlegma maiaceense* (Lath.) Hargitt, Cat. B. xviii. p. 126. Penrisen and surrounding low country.
61. *Ganropicoides rafflesii* Vig. Hargitt, Cat. B. xviii. p. 132. A low-country form: the young male differs very markedly from the adult, nearly the whole of the under surface being dusky, the red crest smaller, the top of the head dark, and with a white patch on the side of the throat.
62. *Miglyptes grammithorax* Less. Hargitt, Cat. B. xviii. p. 385. Pankalan Ampat.
63. *Micropternus badius* Temm. Hargitt, Cat. B. xviii. p. 400. Pankalan Ampat.

## FAMILY ALCEDINIDÆ.

64. *Alcedo euryzone* Temm. Sharp, Cat. B. xvii. p. 154.

Pankalan Ampat, banks of river. We noticed the bird when descending the river from the Dyak village of Sennah to Pankalan Ampat, and about a week later my collectors shot it. Unfortunately by this time I had returned to Kuching, and was consequently unable to sex the bird myself or to make colour notes, and I am afraid that as a result of native carelessness, the present label "female" is untrustworthy. The specimen is a very small one, the total length being only 6.5 in. as against 8 in., the total length of the full-grown adult. It possesses the blue pectoral band spotted with white, characteristic only of the male, and the lower parts are not ferruginous as is usual in females: in many small points this specimen differs slightly from Dr. Sharpe's description (l. c.) but nevertheless I am sure that my identification is correct.

65. *Ceyx (?) erythra* Sharpe. Sharpe, Cat. B. xvii. p. 179.

The genus Ceyx is in a most confused condition, and I am therefore extremely doubtful about a young specimen of this little Kingfisher which was shot close to the summit of Penrissem. The bill is extremely short; '8 inch, as against 1.5 of the adult, and is black, paler towards the tip instead of coral red. The wing-coverts and scapulars are red and there is no blue spot behind. The wing coverts as in *C. erythra*, but there is a black frontal patch as in *C. dillwyni*: further *C. dillwyni* has been found on Dulit, but *C. erythra* has not; I am therefore completely puzzled as to the correct name for our Penrissem specimen, and must wait until I can see more young specimens of both species before absolutely deciding.

66. *Halcyon concreta* Temm. Sharp, Cat. B. xvii. p. 285. Mt. Penrissem 3000 feet.

## FAMILY BUCEROTIDÆ.

67. *Rhinopias vigil* Forst. Grant, Cat. B. xvii. p. 427.

The note of this bird, well represented by its native name

"Tajak," was frequently heard on the mountain, but we did not secure a specimen.

68. *Rhytidoceros undulatus* Shaw. Grant, Cat. B. xvii. p. 382.  
Not common on the mountain.
69. *Anorhinus galeritus* Temm. Grant, Cat. B. xvii. p. 391.  
The commonest species; but none of this family were easy to get, owing to their excessive shyness.
70. *Berenicornis comatus* Raffl. Grant, Cat. B. xvii. p. 423.  
Penrissen.

#### FAM. MEROPIDÆ.

71. *Nyctiornis amicta* Temm. Sharpe, Cat. B. xvii. p. 30.  
Pankalan Ampat.

#### FAM. TROGONIDÆ.

72. *Harpactes diardi* Temm. Grant, Cat. B. xvii. p. 482.  
Low-country and lower slopes of Penrissem.
73. *Harpactes kasumba* Raffl. Grant, Cat. B. xvii. p. 483.  
Occurs with the preceding species.
74. *Harpactes durauclii* Temm. Grant, Cat. B. xvii. p. 491.  
Pankalan Ampat. All the above are omen birds with the Dyaks.
75. *Harpactes dulitensis* Grant. Cat. B. xvii. p. 502, pl. xvii.  
Penrissem from 3,000 feet upwards to the summit. Previously recorded from Kina Balu and Dulit. It is closely allied to *H. oreskios* Temm. from which it differs slightly in coloration.

#### FAM. PODARGIDÆ.

76. *Brachostomus offinis* Blyth. Harttert, Cat. B. xvi. p. 638.  
Common at Pankalan Ampat, where it was frequently seen hawking insects round the tops of trees at twilight : the flight is peculiar and quite unmistakable.

## FAM. CAPITONIDÆ.

77. *Choterha chrysopsis* Goffii. Shelley, Cat. B. xix. p. 59.  
Penrissen above 2,000 feet. The "kayu ara" was in fruit, and this and the two following species of barbets were excessively common, huge flocks sometimes nearly covering the trees bearing their favourite fruit.
78. *Cyanops mystacophanes* Temm. Shelley, Cat. B. xix. p. 72.  
All over the mountain. This bird exhibits considerable variation in plumage in relation both to sex and age (cf. Salvadori Oee. Bor. Tav. I): a very interesting young female specimen was obtained, almost entirely green, with a few blue feathers on the cheeks and round the gape, and without a trace of the red and yellow plumage of the adult.
79. *Mesobucco eximus* Sharpe. Ibis, 1892, p. 324, 1893, pl. xi.  
Penrissen above 2,000 feet.
80. *Caloramphus fuliginosus* Temm. Shelley, Cat. B. xix. p. 51.  
Lower slopes of Penrissen and the surrounding low-country.

## FAM. CUCULIDÆ.

81. *Surniculus lugubris* Horsf. Shelley, Cat. B. xix. p. 227.  
A low-country species.
82. *Cuculus micropterus* Gould. Shelley, Cat. B. xix. p. 241.  
Pankalan Ampat. One female in young plumage with the head and neck mottled with fulvous was obtained.
83. *Rhinortha chlorophaea* Raffl. Shelley, Cat. B. xix. p. 393.  
A common low-country species.
84. *Rhopodytes borneensis* Bp. Shelley, Cat. B. xix. p. 389.  
Low-country. Native name "Mindu."
85. *Phanicophoës microrhinus* Berl. Nov. Zool. p. 71, Vol. II, 1895.  
Low-country. This form has been separated off from *Perythroganathus* by Berlepsch (I. e.) on account of the difference in the shape of the nasal apertures, perhaps

rather a sub-specific than a specific distinction. The following is a tabular arrangement of Berlepsch's views concerning the genus *Phoenicophorus*. The genera adopted in the Brit. Mus. Cat. being placed in brackets.

- P. pyrrhocephalus* Forst. Ceylon.  
*P. (Urocoecyx) aeneicardus* (T. & E. Verr.) Mentawai Is.  
*P. (Urocoecyx) erythrogynathus* Bp. Malacca and Sumatra.  
*P. (Urocoecyx) microrhynchus* Berl. Borneo and Natuna Is.  
*P. (Rhinococcyx) curvirostris* Shaw. Java.  
*P. (Dryococcyx) Lawingtoni* Sharpe. Palawan.  
*P. (Rhamphococcyx) calorhynchus* Tem. Celebes.  
86. *Zanclostomus javanicus* Horsf. Shelley, Cat. B. xix. p. 380.  
Penrissem 3,000-4,000 feet.

FAM. COLUMBIDÆ.

87. *Macropygia ruficeps* Temm. Salvadori, Cat. B. xxi. p. 360.  
Penrissem 4,000 feet.  
88. *Osmotreron olax* Temm. Salvadori, Cat. B. xxi p. 64.

## APPENDIX II.

### Plants collected at Penrisseen.

BY H. N. RIDLEY.

This collection, though a small one, contains a large proportion of novelties, showing that a more complete botanical survey would be well worth making. The plants obtained are of typical Bornean mountain flora facies, and most closely resemble the plants of Kina Balu in North East Borneo.

*Sonerila borneensis* Cogn. at 3,500 feet; flowers white, stamens yellow.

" " Var (?) A smaller plant nearly glabrous, common.

*Begonia borneensis*. A. D. C. At 3,000 feet alt.

*Argostemma gracile* Stapf. Mt. Seruru, a Peak of Penrisseen, 4,500 feet. Only previously known from Mt. Kina Balu.

*Ophiorrhiza fibrillosa* n. sp.

Stem over a foot tall, rather stout, covered with short scattered brown hairs. Leaves lanceolate acute at both ends 12 nerved, 4 inches longer less,  $1\frac{1}{2}$  inch wide green and glabrous above glaucous beneath and nerves covered with red hairs, petiole  $\frac{1}{2}$  inch long covered with red hairs. Stipules narrow divided into two branches each ending in subulate fibrils, persistent  $\frac{1}{4}$  inch long hairy. Cymes in terminal axils much shorter than the leaves covered with red wool, about an inch long. Flowers shortly petioled white, Calyx pustular teeth short acute. Corolla tube dilate at base  $\frac{1}{4}$  inch long, lobes short oblong obtuse pustular. Stamens oblong obtuse, filaments very short. Style slender, stigma broadly bilobed lobes rounded. Fruit absent. At 4,000 feet, flowers white.

Allied to *O. subfalcifolia* Miq. The stipules are peculiar in being broken up into fibrils, and being persistent, and are

crowded together in the terminal buds, giving them a curious tufted appearance.

*Rhododendron cuneifolium* var. *subspathulatum*.

A much branched twiggy plant, leaves mostly spathulate apices not truncate as in the type; flower tubular, lobes quite rounded. At 4,500 feet. Flowers red waxy. This might perhaps be distinguished as a separate species, but the materials, comprising but a single flower, are hardly adequate. The type was obtained on Kina Balu by Dr. Haviland.

*Nepenthes tentaculata* Hook fil. The only species seen, on the top of a felled tree, at 4,000 feet altitude. Not rare in North Borneo.

*Eria megalophla* n. sp.

Rhizome slender  $\frac{1}{2}$  inch thick covered with short brown sheaths, roots long and wiry. Stems distant  $\frac{1}{2}$  to an inch apart slender slightly thickened above, covered with brown short scattered sheaths, 4 to 5 inches tall less than  $\frac{1}{2}$  inch through. Leaves 2, narrow lanceolate acuminate base acute 7 nerved  $3\frac{1}{2}$  inch long  $\frac{1}{2}$  inch wide. Flower orange from a tuft of papery brown sheaths  $\frac{1}{2}$  inch long, above the leaves. Pedicel and ovary very slender  $\frac{1}{2}$  inch long. Upper sepal lanceolate  $\frac{1}{2}$  inch long, lower ones broader subfalcate. Petals linear lorate, narrower. Lip  $\frac{1}{2}$  inch long, base narrow fleshy curved, with a process at base, lateral lobes falcate obtuse broad, terminal one broadly subquadrate margins rounded. Apex broad truncate  $\frac{1}{2}$  inch across; two low rounded ridges between the lateral lobes, and a single large thin keel edge denticulate running the whole length of the midlobe and ending in a projecting point, with three short parallel ridges on each side at right angles to central ridge. Column long arched. At 4,000 feet alt. Flower orange. Allied to *E. neglecta* Ridl. but differs in its very slender stems, remote from each other, and remarkable lip with an unusually large central keel.

*Calanthe Shelfordi* n. sp.

Leaves nine, petiole 3 inches long tapering into the lanceolate acuminate blade 1 foot long, 2 inches across, five nerved,

herbaceous plicate. Raceme 8 inches long slender. Flowers numerous flesh color, nearly an inch across. Pedicels slender  $\frac{1}{2}$  to  $\frac{3}{4}$  inch long. Sepals oblong lanceolate acute, upper one broadest. Petals broadly spatulate acute. Lip 3 lobed much shorter  $\frac{1}{2}$  inch long, lateral lobes short rounded, median elongate linear oblong apex dilated rounded then acute; spur  $\frac{1}{2}$  inch long pendulous dilated and hooked at apex; calli on lip 2 small wartlike processes. Clinandrium deep edges thin elevated undulate, rostellum long acuminate. At 4,800 feet near summit. Flowers flesh color. Perhaps as near *C. Curculigooides* as any species, but with a more slender raceme and a very different lip.

### APPENDIX III.

#### List of the Ferns of Penrissen.

BY BISHOP HOSE.

1. *Trichomanes microcinnium* Blume. 4,100 feet, common.
2. *Davallia (Humata) pedata* Smith. 3,500 feet.
3. *Lindsaea ciliolata*. Swartz.
4. " *coccinea* Smith.
5. " *scandens* Blk.
6. *Polygodium (Goniophlebium) siccum* Baker. Previously recorded from Mt. Dilit only.
7. " *(Eupol) decolor* Brack. 3,500 feet.
8. *Polygodium hirtellum* Bl. This species is new to Borneo, being previously recorded from Java, Perak, Ceylon, Philippines and China.
9. *Polyodium obliquatum* Bl. Also new to Borneo.
10. " *(Goniophlebium) (?) sp. nov.* This is a very interesting fern. "No other simple form of the sub-genus has been found in this part of the world, so far as I know." (G. F. S. & S.)
11. *Nephrodium (?) lineatum* Coleb. None of the fronds fertile. If correctly identified, new to Borneo.
12. *Acrostichum (Chrysodium) sp. (?) near blumeanum* Blk. No fertile fronds.

#### LYCOPODIACEAE.

*Selaginella atrorubens* Spring var. (?) Differs from the type in having unusually long cusps to the leaves of the upper plane. There is no fruit on it. Common.

*S. obesa* Bak. Specimens without fruit. Common.

Mosses and Hepatics collected by A. H.  
Everett and named by F. Brotherus.

MOSSES.

*Calyptopera cristatum* Hampe.

*Neckera gracilenta* var. *flagellifera* Broth. n. var.

*Choetomitrion leptoma* Schwager.

*C. orthorrhynchum* Bry. Jav.

*Thuidium Everettii* Broth. n. sp.

HEPATICÆ.

*Bazzania australis* Lindenb.

*R. Shelford.*

## The Flora of Singapore.

BY H. N. RIDLEY.

*Introduction.* The island of Singapore with the small islands of Pulau Ubin and Pulau Tekong in the Johore strait and a few smaller ones lying within English waters form the area the flora of which is enumerated in this paper. The whole is little more than 200 square miles in extent and consists of undulating country, the highest hill being Bukit Timah with an altitude of 500 feet above sea level. The Geology of the island was the subject of a paper by Mr. J. R. Logan (Journ. As. Soc. Beng. xvi. p. 519, published in 1846), but unfortunately he much misunderstood it, mistaking sedimentary rocks for volcanic ones. The bigger hills, Bukit Timah, Bukit Mandai, and Tanjong Gol, are composed of a grey granite, which crops out again near Bajau, Changi and Pulau Ubin. The rest of the island is covered with sedimentary deposits of clays, gravels, and sands, often very ferruginous and permeated with bands of clay-ironstone, very much resembling that of some of the Wealden beds in Kent. This clay iron-stone has unfortunately received the name of Laterite here, a name properly applied to soils baked by a lava-flow, or other volcanic heat. These sedimentary rocks have never produced any fossils except some obscure traces of vegetable remains. They appear to have been derived from disintegrated and decomposed granite, the ironstone bands being formed in many cases at a much later date. No borings of any depth having been made it is impossible to say how deep these strata are, but it is probable that they are of very great thickness and comparatively modern, as appears to be the case in Selangor and elsewhere. In the south of the island in some spots the strata are very strongly upheaved.

Originally the island appears to have been covered with a dense forest, except along the mangrove edged rivers and the sandy tract of country lying between Tanjong Ru and Changi point. But soon after it was acquired, a great deal of this forest

was felled, partly for the value of the timber and partly for cultivation. Later a very large proportion of the cleared ground was abandoned, and became covered with secondary growth, or lalang, and every year still sees the disappearance of some woodland, so that in several of the localities quoted for certain plants in this list, such as Ang Mo Kio, few traces of any native plants can now be found. The names of many villages and districts are taken from trees which doubtless plentiful fifty years ago are now either very scarce or quite extinct. Such are Kranji (*Dialium*), Changi (*Balanocarpus*), Tampenis (*Sloetia sideroxylon*), Tanjong Ru, the Cape of Casuarinas, Kampong Gelam, the village of *Melaleuca*. Extensively as the indigenous flora has been destroyed in this way, I have succeeded in finding most of the plants collected here by Wallich in 1822; and of those mentioned in his Catalogue which I have not recovered, some at least were evidently wrongly localised, having been probably collected in Penang. Many of the trees, however, which were probably formerly more abundant, are represented now by single specimens.

A few fairly large and representative tracts of jungle remain, and though in most cases much of the more valuable timber has been removed, these contain the most varied and interesting portions of the flora. Among the biggest trees therein are the *Dipterocarpus*, *Dyera*, *Dichapais*, *Irrigia*, *Kumpasia*, species of *Mangifera*, *Artocarpus* and *Tarrietia*. Mixed with these are numerous smaller trees and shrubs of all orders, with rattans, and other palms, and especially in rocky spots and damp water-courses, are ground orchids, Scitamineæ, aroids, ferns, *Ebermaiera*, *Pentaphragma*, *Cyrtandra* and many other smaller plants. Here too grow the curious little saprophytes *Thiomia*, *Scaphila*, *Aphyllorchis*, *Burmannia*, etc. Many climbing plants such as *Uncaria*, *Willughbeia*, *Bauhinia*, *Strychnos* and *Gnetum* form huge lianes climbing to the tops of the trees and covering them with a mat of foliage. On the branches of the loftiest trees grow many epiphytes not met with elsewhere, orchids, ferns, such as the rare *Davallia triphylla*, *Rhododendron*, *Vaccinium* and *Dischidia*, and it is interesting to note that many of these plants, which in the low country grow only on this elevated position, are to be met with as terrestrial or rock plants at greater elevations in the peninsula. The banks of the larger streams and rivers and a

good portion of the coast line where mud is deposited are edged with a thick mangrove jungle composed of *Rhizophoraceae* (*Rhizophora*, *Bruguiera*, *Ceriops*) *Carapa*, *Lumnitzera*, *Avicennia* and *Heritiera* on the branches of which grow abundance of small orchids, ferns, *Lycopodium*, *Psilotum*, *Heptapleurum*, *Pachycentria*, *Medinillopsis* and other epiphytes, while in the mud on suitable spots grow such herbaceous plants as *Acanthus*, *Cryptocoryne ciliata*, *Tristellateia*, *Oxothocharis* and some Cyperaceae and grasses. Inland just behind the mangroves the ground is often sandy and covered with woods of comparatively small trees, *Eugenia*, *Podocarpus*, *Gelonia*, *Argyraea*, *Afzelia*, etc., with clumps of the Nibung palm (*Oncosperma tigillaria*), and on these and on the ground grow many orchids, *Cirrhopetalum*, *Bulbophyllum*, *Coelogyne*, *Plocoglottis*, *Platyclinis*, and *Eria*.

The coast line from Tanjong Ru to Changi is also very sandy, and here is a very distinct flora much resembling that which borders the Pahang river near its mouth. It is rich in grasses and sedges, *Xyris*, *Cyanotis*, and other herbaceous plants, with bushes of *Rhodomyrtus*, *Vaccinium*, *Leucopogon*, *Capparis*, *Eugenia*, etc. Unfortunately a great portion of this district has been put under coconut cultivation, and the greater part of the flora has disappeared, except at Changi point where it still remains.

As a very large portion of the island has been cleared and cultivated, and often abandoned, there are very large tracts covered either with Lalang (*Imperata cylindrica*) or fern either *Gleichenia Linearis* or bracken, *Pteris aquilina* or in swampy spots with *Scleria* to the exclusion of almost everything else. In many places however secondary growth has sprung up (Belukar). This consists of small trees or shrubs of *Macaranga javanica* and *M. hypoleuca*, *Rhodamnia trinervia*, *Adinandra dumosa*, *Vitis pubescens*, *Melastoma polyanthum*, *Archytia Vahlii*, *Arthrophyllum diversifolium* and a few others.

In waste ground near villages and in cultivated spots are a number of weeds, many of which are well known as very widely distributed plants, and most of which have probably been introduced accidentally or intentionally at no very great distance of time. These weeds include most of the *Compositae*, Grasses, *Labiatae* and probably all the *Umbelliferae* and *Solanaceae*.

*ceae*. It is perhaps worth noting that very few of these are to be found in Wallich's collection made in 1822, showing that in all probability they were introduced at a later date. Among these weeds one or two are interesting as not occurring in India, such are *Clitoria cajanifolia*, and *Cleome aculeata*, both South American plants, which also occur as weeds in Java, whence probably they were carried accidentally to Singapore.

The flora geographically speaking is typically Malayan, and resembles as might be expected that of Johore, and to a certain extent that of the neighbouring coast of Sumatra. A few plants occurring here are as far as is known endemic, but it is probable that most will be re-discovered in the neighbouring countries, when they are more thoroughly explored. These endemic plants not known to occur elsewhere are marked with a \*. The absence of certain plants common in the peninsula is somewhat remarkable, such are *Eurya acuminata* and *Grewia umbellata*, and there are several striking plants to be found on the neighbouring islands, and on the coast of Johore, especially near Tanjong Kupang, which are quite absent from our flora. Of the native flora it will be noticed that the greater number of plants are either trees or shrubs, herbaceous plants being comparatively scarce in the forests, and chiefly to be found in the open country in the sandy district of the coast. Those of the forest region being usually epiphytes, orchids, Piperaceae, or Scitamineae, aroids, grasses and sedges, with a few saprophytes.

The most extensively represented orders here are those of the *Euphorbiaceae*, *Urticaceae*, *Rubiaceae* and *Orchidaceae*. The variety of the latter will surprise many residents who have probably seen not more than one or two species growing wild here, but the fact that these plants are very local and frequently occur on the upper branches of the loftiest trees, where they are difficult to see and to obtain, accounts for their being so often overlooked. The largest genera are those of the Figs (*Ficus*) and nutmeg (*Myristica*).

As in most equatorial regions, the number of species in proportion to the number of individuals is very large. A Malay jungle consists of innumerable trees, shrubs and climbers, all apparently distinct, and individuals of any one species occurring singly here and there, often very far apart, so that these forests

have a very different appearance from those of the more temperate zones, which frequently consist of but one or two kinds. The contrast is well seen in comparing the English flora with that of Singapore. In Singapore with an area of 200 square miles we have over 1,900 species of flowering plants, while the flora of the British Isles with an area of 121,115 square miles produces but 1,200 species, while of ferns we have here over 130 species, nearly double the number in Europe, and more than three times the number in the British Isles.

*Seasons.* There is no great amount of difference in the rainfall throughout the year, although as a rule heavier falls occur in December and January than at other times, so that plants here have no definite resting periods and are nearly all truly evergreen. Certain plants, however, such as *Cratoeglon formosana* and *Ficus Miquelii* shed all their leaves at tolerably regular intervals, remaining quite bare for one or two days, when the young shoots begin to unfold, and in a few days they are quite leafy again. This change is often but not always followed immediately by the appearance of the flowers, and often the young leaves thus produced are of a brighter green, or brilliant red, orange, white or blue. This change takes place usually three or four times a year, and every tree of the kind in the district undergoes the change on the same day. It is not till we get north of Penang that we find a definite period of rest in which all or almost all plants shed their leaves altogether and become quite bare. A good series of observations on these phenological phenomena would probably throw light on the causes of these irregular seasons.

Very few plants have a definite flowering month. A large number flower more or less steadily throughout the year. Others flower at regular periods three or four times a year, almost every plant of a given kind flowering simultaneously in the district. This is best known in the case of the Pigeon orchid, *Dendrobium crumenatum*. In this plant the flowers are produced at periods of a little over a month, or two months. The exact day differs in different parts of the peninsula, but in each district they all appear in the same day, and it is remarkable that plants brought to Singapore even from as far north as Siam open their flowers on the day for Singapore, and not on that for Siam. It

is not rare however to find certain plants of Pigeon orchid which do not flower on the regular day, but have a distinct day which they appear to keep to with equal regularity. A curious fact is that another species of *Dendrobium* (*D. eriniferum*) invariably flowers in Singapore on the day preceding that of *D. crumenatum*, whenever that happens to be. It might be thought that the weather in the district in which the plant was growing was the influencing agent, but this appears to have but little effect on the orchids. On one occasion (Dec. 5, 1893) the pigeon orchids developed their flowers so far that they were obviously ready to open them on that day, but an extraordinarily heavy rain retarded them, and the flowers opened the next day, but except in cases like this the weather previous to the flowering does not seem to make any difference to the date of flowering. Some few plants have a regular annual flowering season, such are *Calanthe cuneiglauca* in September, and *Grammatophyllum*, July and August. A certain number of trees flower only every fifth year, notably the *Dipterocarpus*. Every fifth year there appears to be an average higher temperature, and a period of greater dryness in May or June than in other years, and then and only then is it possible to obtain flowers of these trees. Such trees are most of the *Dipterocarpus, xanthophyllum* *Kunstleri*, *Careya* sp. In this case also all the plants in a given district flower simultaneously. It can easily be understood that it is very important to a plant that all should flower on the same day in order that they may be cross-fertilized by the insects that visit them, and this is especially the case in plants in which the flowers last but a single day, as in the case of the Pigeon orchid, but it is difficult to see how this is brought about. A good many trees seem to flower even less often than this and there are not a few which though apparently full grown healthy trees have not given flowers once in ten years.

#### *Colors of flowers.*

As is well known the colors of flowers depend to a large extent on the kind of insect fertilizer for which they are destined to prove attractive. The most abundant insects in the thick jungle are the flies (*Diptera*) and these appear often in enormous abundance when certain trees are in bloom. The Oaks and

Chestnuts, *Sindora* and *Kurrimia* are particularly attractive to them and the roar of their wings can be heard often at some distance from the tree. The chief of these flies is a black *Muscæ* with red eyes. The flowers of fly-fertilized plants are usually small and green or whitish, generally possessing an unpleasant odor. Smaller herbaceous plants growing in dark shady woods often have deep brownish purple flowers sometimes with an odor of carrion, at others sweet and aromatic, such are *Amorphophallus*, *Thottea*, *Tacca* and many orchids. These are also fly-fertilized. Many trees produce masses of white flowers in large panicles or corymbs. These are very attractive to butterflies and bees, such are many of the Eugenias, *Erodia*, *Rhodamnia*, and *Melanorrhœa*. I have noticed as showing the bearing of the color of the flowers on insect visitors, that while *Eugenia lineata* with corymbs of white flowers attracts innumerable butterflies and bees and the pollen-eating flies (*Syrpha*), another species of Eugenia with apple-green flowers, which is growing close by was not visited either by butterflies or bees, but by flies similar to those which visit the oaks. Pink flowers are not so common, and are usually visited by bees, as are the deep red blossoms of *Cratoxylon arborescens*, *Gomphia Hookeri*, and *Eurycoma*. Scarlet and bright reds are rare in Singapore except in introduced plants, but we have also the beautiful *Aeschynanthus*, *Rhododendron*, some *Loranthi*, and some species of *Hornstedtia*. The red flowers are most attractive to the Sun-birds, and to butterflies. Bright yellow flowers are chiefly to be met with in open country especially near the sea; such are *Wedelia*, *Xyris*, *Phylidrum*, *Utricularia* (most), *Wormia*, *Timonius*, and *Gomphia sumatrana*. The rarest color of all is blue, which is also to be met with almost exclusively in open spots. *Burmannia coelestis*, *Cosmelina*, *Cyanotis*, *Urticularia affinis*, *Evolulus*, *Monochoria*, *Desmodium heterophyllum*, are almost the only native blue flowers here.

Visitors to the tropics are often surprised by the apparent paucity and inconspicuousness of the flowers. This is partly due to the enormous proportion of foliage, which conceals the flowers, but the fact that the greater number of our flowers are adapted for fertilization by Diptera and small Hymenoptera, the most abundant insects in the forests, and are consequently small and green or whitish, accounts to a large extent for the small

amount of show that the blossoms make in the great masses of foliage.

*Botanists.* The number of botanists who have collected or studied the flora of Singapore is even more limited than that of Penang. The first of them was naturally *Sir Stamford Raffles* who aided by *William Jack* made extensive collections, all or almost all of which were destroyed in the burning of the "Fame." (For an account of Jack and some others of the Singapore botanists, see Journal 25, p. 163). Shortly after the founding of Singapore *Nathaniel Wallich* came to Singapore to recuperate after his great Nepal expedition. He remained here about five months and established the first Botanic Garden, Nov. 1822, being Superintendent of it. This Garden, consisting of 48 acres, included the Government Garden on what is now known as Fort Canning Hill. After he returned to Calcutta, Jan. 1823, Dr. Montgomerie took charge of the Garden till 1827. Wallich seems to have promised to send an assistant from Calcutta Gardens, but did not do so. The Garden, which chiefly contained Nutmegs and Cloves, was abolished later, and no trace of it remains. Dr. Wallich seems to have taken some interest in the development of Singapore, and was one of a committee of three to fix on the site of the town. He built a house, Botany Hall, to stay in during his residence here.

His collection of dried plants was an extensive one, and was eventually distributed with the rest of the East India Company's herbarium. The greater number of species which he discovered here I have been able to find still in Singapore, but some appear to have quite vanished. This is not surprising when it is remembered that at that time the district in which he was collecting, *i.e.* the neighbourhood of the town, was thick jungle, of which nearly every trace has now disappeared under cultivation. In his Catalogue many of the plants are localised "Singapore et Penang," and as I note that many of these are strictly hill plants occurring at a higher elevation than there is in Singapore, I take it that these plants were in a collection of which the exact locality was lost, and that the label perhaps should have been rather "Singapore or Penang." Some few however of the specimens labelled as from this region have never since been found in the peninsula, e. g. *Xylia dolabriformis*, a

well known Indian tree, and it is probable that the locality is quite wrong.

Col. Farquhar, the first Resident of Singapore, and John Prince, Resident Councillor in 1827, who took a little interest in the botany of the island, are commemorated in the names of some plants, e. g. *Myristica Farquhariana*, and *Erycibe Princei*, but little was done in botanical research for many years. In or about 1839, Hugh Cuming well known for his immense botanical and conchological collections in the Philippines, visited Singapore and also ascended Mount Ophir. While in the Straits he seems to have chiefly devoted himself to collecting orchids, and to have sent home a number of live ones, among which were *Coelogyne Cumingi*, and *Dendrobium longicolle*. William Lobb, orchid collector for Messrs Veitch, visited Penang and Singapore in 1845, but as mentioned in Journal 25, p. 166, his specimens from the Straits Settlements, Java and India were all mixed up in distribution, so that his localities as quoted in books are quite doubtful. Surgeon-General Maingay during his residence in Singapore made extensive collections, but many of these again were irregularly labelled, and some mentioned in the Flora of British India as from Singapore were probably either collected in Malacca or Penang.

Mr. Murton the first head of the present Botanic Gardens, 1875 to 1880, collected a number of plants, of which a few were sent to Kew, and a few, chiefly ferns, are still in the Botanic Gardens Herbarium. N. Cantley, who succeeded him, employed collectors and obtained a very large number of specimens, but unfortunately hardly any were strictly localised, and many labelled from Singapore in the herbarium, are either cultivated plants or from some part of the peninsula, so that in most cases I have been unable to quote safely from his herbarium.

Among other collectors whose names appear in books, associated to a small extent with Singapore plants, should be mentioned, Dr. Thomas Oxley, who wrote some papers in Logan's Journal, one of which dealt with the Flora of Singapore, but chiefly with Economic plants, while other papers treat of Nutmegs and Gutta percha. He seems to have collected plants, saying that he had collected between 40 and 50 orchids, but what became of his collections and manuscripts, I cannot find

out. He died in or about 1858.

*Sir Robert Schomburgk*, well known for his explorations in Guiana, where he discovered the *Victoria regia*, was appointed British Consul in Siam in 1857. He visited Singapore and collected a few plants there, which he sent to Kew, and which were described in the Flora of British India. Some of them, however, were evidently obtained from gardens.

*Dr. T. Anderson*, 1832 to 1870, was Director of Calcutta Botanic Gardens. He appears to have visited Singapore at some time, and obtained several plants of interest. He devoted himself to the *Acanthaceae*, and *Eranthemum Andersoni* Mast, a common garden plant here was named after him.

*Mr. R. W. Hullett* made some years ago an excellent herbarium of Singapore plants, which he eventually presented to the Botanic Gardens. Duplicate specimens were sent to Kew and to Calcutta, where they were named, and several new species bear his name.

In the following list all plants with no collector's name were obtained by myself or by native collectors employed at the Gardens, and the numbers attached are those of my distribution-series. Endemic species, not yet known from elsewhere are marked with an asterisk and introduced plants, which have not properly established themselves but which occur in waste ground and the like, are included in brackets. The Mosses, Lichens, Fungi and Algae, are deferred. Collections of these have been made and submitted to experts, and I hope to publish an account of them at a later date.

## DICOTYLEDONS.

## DILLENIACEÆ.

*Tetracera Assa* Dec. A scrambling shrub often forming thickets, flowers white or pinkish. Common in open country, Balaustier plain, Sepoy lines, Fort Canning, Changi.

*T. Assa* var. Garden Jungle. A very different looking plant, but Dr. King considers it only a large form.

*T. euryandra* Vah. Climber not rare, Cluny Road, Kranji.

*T. macrophylla* Wall. Climber common in woods, but seldom to be found in flower. Tanglin, etc.

*T. sagifolia* Bl. Not common. Woods, Garden Jungle, Selitar.

*Wormia*. Large shrubs or trees with showy yellow or white flowers.

*W. suffruticosa* Griff. A large bush in damp open country. The flowers are about 3 inches across bright yellow. The fruits when ripe split open like a star and are rosy pink inside, with small black seeds covered with a scarlet aril. The leaves are rather curious from the way in which the winged petioles are closed over the buds. It flowers constantly all the year. Tanglin, Jurong, Pulau Ubin, Pulau Tekong.

*W. pulchella* Jack. A small bushy tree with oval deep green leaves and pale yellow flowers. It grows in wet places, Tanglin, Bukit Timah Road.

*W. tomentella* Bl. A tall stout tree. Garden jungle, Selitar, Bukit Timah.

*W. Scortechinii* King. A small tree with inconspicuous apetalous flowers. Rare, Garden Jungle.

*W. sp* near *W. oblongifolia*, but having anthers hairy all over and white flowers. Bukit Mandai.

*Dillenia indica* L. This grand tree with its huge white flowers is doubtfully wild here. It occurs near the Reservoir, Bukit Panjang.

#### MAGNOLIACEÆ.

This order, chiefly of trees\* of the hill districts, is not unrepresented here.

*Talima lanigera* Hook. fil. A large bush rather than a tree with large white flowers and stiff dark green leaves. Damp woods, near Chan Chu Kang, Ang Mo Kio, Kranji, Choa Chu Kang.

*T. elegans* Miq. *Aromadendron elegans* Bl. A tall tree with grey bark about 40 feet tall and a foot through. Flowers white sweet-scented. Rare. Garden Jungle.

*Kadsura caulis* Bl. A climber with rough corky bark and rosy flowers growing on the stem. Garden jungle, Bukit Timah, Kranji.

*K. scandens* Bl. "Akar Dama Dama." Forests, Bukit Timah, Bajau.

To this order also belong the Champaks *Michelia Champaka*, and *M. longifolia* Bl. often cultivated for their sweet flowers.

#### ANONACEÆ.

*Stelechocarpus Burahol* Hook. fil. "Singapore Lobb." This Javanese plant has never again been collected in the peninsula and is probably wrongly localised.

*Cyathostemma Scortechinii* King. A big climber bearing small green flowers on the stem, and rather large orange fruits. Common Garden jungle, Bidadari, Bukit Timah, Jurong, Pulau Ubin.

*C. Hookeri* King. Not common. Flowers yellow. Garden jungle.

*Uvaria*. Climbers with purple rarely yellow flowers.

*U. dulcis* Dunal. Rare, Bukit Timah.

- U. Lobbiana* Hook. fil. Garden jungle,
- U. Ridleyi* King. Bukit Mandai.
- U. macrophylla* Roxb. Common all over Singapore.
- U. hirsuta* Jack. Very hairy, flowers bright red. Garden jungle, Changi, etc. Common.
- U. subrepanda* Wall.\* Singapore (Wallich No. 6483). A very little known species, only collected by Wallich.
- Elispeia cuneifolia* Hook. fil. A lofty climber with yellow flowers. Common. Garden Jungle, Reservoir Woods.
- Cyathocalyx virgatus* King. A small tree with green flowers. Rare, Bukit Timah (Hullett).
- C. Maingayi* Hook. fil. (Cantley's collection.) Perhaps wrongly localised.
- Artobotrys*. Climbers with white or green flowers, and very curious woody hooks by which the plant climbs.
- A. Wrayi* King. Flowers large. Cluny Road, Bukit Mandai.
- A. suaveolens* Bl. Flowers small. Common all over Singapore.
- A. Maiuyayi* Hook. fil. Tanglin.
- Drepananthus pruriiferus* Maing. "Antoi hitam." A tall straight tree. Garden jungle, Kranji.
- Unona discolor* Vahl. "Akar Darah." Garden jungle.
- U. dumosa* Roxb. Cluny Road.
- U. longiflora* Roxb. Common, Kranji, Bukit Timah, Jurong, Garden jungle.
- U. dasymuschala* Bl. Common, Bukit Mandai. Chan Chu Kang Garden jungle.
- U. deemantha* Hook. f. A small tree with yellow flowers. Common, Garden jungle, Changi, Chan Chu Kang.

- U. stenopetala* var. A small tree with buff-colored flowers. Garden jungle, Changi, Bukit Timah.
- Polyalthia*. Small to medium-sized trees.
- P. sumatrana* King. Flowers green, fruit pink with darker blotches, rare. Chan Chu Kang.
- P. Scortechinii* King. "Kenanga butan." A fairly large tree, with large yellow flowers like those of Cananga. Not common, Garden jungle.
- P. macropoda* King. A tree with large orange fruits very showy. Bukit Timah.
- P. Teysmanni* King. Common, Chan Chu Kang, Garden jungle.
- P. bullata* King. Stated in King's Materials to have been collected by me in Singapore, was collected by Cantley and perhaps wrongly localised. It occurs in Selangor and Perak.
- P. cinnamomea* Hook. fil. is from the same collection, and was also collected by Wallich in Singapore. I have never found it here.
- Goniothalamus*. Small or medium sized trees or shrubs.
- G. malayanus* Hook. fil. Bukit Timah, Pulau Damar.
- G. Topis* Miq. Selitar, Jurong.
- G. Ridleyi* King. A medium-sized tree with large tufts of dull purplish flowers on the stem, chiefly at the base. Sungai Morai, Bukit Timah.
- Orophea hastata* King. Bukit Timah.
- Popovia tomentosa* Maing. A small tree. Not common, Garden jungle, Bajau.
- P. ramosissima* Hook. fil. Bukit Timah.
- Oegnitria calycina* King. Dense woods, Garden jungle.
- O. affinis* King. Sumbawang, Bukit Timah.

- Melodorum*. Climbers with yellow flowers usually sweet-scented.
- M. foliages* Hook. fil. Common in thickets, Bukit Mandai, Toa Payoh, Tengah, Chan Chu Kang.
- M. manubriatum* Hook. fil. Changi, Bedoh.
- M. latifolium* Hook. fil. Garden jungle, Toas, Selitar.
- M. cynthiaicum* Maingay. Common, Bukit Timah, Bukit Mandai, Chan Chu Kang, Loyang.
- M. lanuginosum* Hook. fil. Fairly common, Bukit Timah, Sumbawang, Jurong.
- M. prismaticum* Hook. fil. Garden jungle, Changi, Krauji.
- M. elegans* Hook. fil. Garden jungle, Selitar.
- M. pisocarpum* Hook. fil. Bukit Timah, Bukit Mandai, Toas.
- Xylepidia oxyantha* Hook. fil. Singapore (Wallich 6478). Not seen.
- X. dicarpa* Hook. fil. \* Singapore (Maingay). Not seen.
- X. malayana* Hook. fil. Not common, Bukit Arang, Chan Chu Kang.
- X. coulata* Hook. fil. Singapore (Wallich 6452) Maingay. Not seen.
- X. magna* Maingay. "Singapore Ridley" in Materials; was not collected in Singapore.
- X. ferruginea* Hook. fil. "Jangkang." A tall tree, flowers green, fruit long cylindrical red. Common, Bukit Timah, Selitar, Changi, Sungei Morai.
- X. Ridleyi* King. \* Rare, Changi, Bukit Timah.
- Phaanthus nutans* Hook. fil. A shrub with green flowers. Common, Garden Jungle, Bukit Timah.
- Ph. lucidus* Oliver. Common. A bush. Bukit Timah, Garden Jungle, Tanjong Gol.

*Mezettia leptopoda* Oliver. A very large tree with green flowers, and large globose fruit containing two very hard seeds, "Poko Prah." Garden Jungle.

#### MENISPERMACEAE.

Climbing plants with very small dioecious flowers and drupaceous carpels with the seeds usually curved.

*Tinospora cordifolia* Miers. Probably introduced. Macpherson Road, Balestier plain, Pulau Ubin.

*Thosaneicum petiolare* Miers. "Akar Lankap." A stout climber with milky juice, flowers white, fruit green with white spots. A decoction of the roots is used for rheumatism. Common in open woods, Garden Jungle, Siglap, Jurong, Bukit Mandai.

*Fibraurea chloroleuca* Miers. "Akar Kuning." A big woody climber with yellow juice formerly used in dyeing. The male flowers are white in large panicles on the stem. The females green. The fruit is about an inch long, orange-colored. Common all over Singapore.

*Coccinium fenestratum* Colebr. "Akar Kunyit, Kunyit Babi." A stout woody climber with large round leaves white beneath and large globular fruits. Common in woods. Chan Chu Kang, Changi, etc.

*Hypserpa triflora* Miers. A slender climber with narrow deep green leaves and small green flowers. Not common. Hedges, Tanglin, Selitar, Jurong, Chua Chu Kang.

*Limacia reticulata* Miers. A low rather slender climber, the leaves covered with a velvety golden olive fur. Common in open country. Tanglin, Bukit Timah, Changi, etc.

*J. Kunstleri* King. A pretty little slender climber with white flowers and yellow stamens. Rare, on bushes by the sea. Changi beach.

*Stephanotis hernandifolia* Wall. A slender climber with peltate

leaves, white flowers and red fruits. Edges of jungle, not rare. Chan Chu Kang, Bukit Mandai, Jurong.

*Cycla peltata* Hook, fil. var. *Arnotti*. Miers. A slender climber with orbicular ovate hairy leaves, small hanging panicles of green flowers and white flat fruits. The natives boil the leaves with sugar and make a kind of jelly not remarkably delicious. Common in hedges, Tanglin, Chua Chu Kang, Pulau Ubin.

#### NYMPHEACEÆ.

*Euro'ya Motleyi* Hook. var. *Kunstleri*, "Daun Kalapa." This grows in shallow muddy streams in thick jungle. It has round dark-colored leaves, and inconspicuous dull colored flowers, greenish or brown outside and yellow and pink within. Capsule pink. Local, Bukit Timah, Ang Mo Kio.

(*Nelum'ium speciosum* Willd. The Lotus is often cultivated by the Chinese, but not wild here.)

#### CAPPARIDÆ.

*Cleome aculeatum* Jacq. *Cl. Hullettii* King. An introduced thorny weed with white flowers, native of the West Indies, occurs round Tanglin and Kallang.

*Cl. viscosa* L. A sticky weed about a foot tall, with yellow flowers, occurs near the town casually.

*Capparis Finlaysoniana* Wall. A thorny climber with large white flowers with a yellow spot in the throat, and a sausage-shaped red fruit. Rare. In sandy spots near Changi.

#### VIOLACEÆ.

The only genus represented here is the shrubby *alsodeia* with small yellow and white flowers.

*Alsodeia echinocarpa* Korth. "Sebilek." A shrub or treelet with ovate serrate leaves, small white flowers, and cap-

sules covered with mossy hairs. The seeds are used as a purgative. Common in dry woods. Reservoir, Chan Chu Kang, Chna Chu Kang.

*A. floribunda* King. Woods near Ang Mo Kio.

*A. membranacea* King. Ang Mo Kio, Changi.

*A. Knutsoniana* King. Singapore (Wallich). Not seen.

#### BIXINAE.

*Scopolia rhinanthera* Clos. A shrub or small tree, thorny with white flowers and black berries. Sandy spots near the sea. Changi, Serangoon River.

*Flocourtia Rukam* Zoll. A thorny tree, with small yellowish flowers and globose dull red berries, with a taste of gooseberries. Common in woods and even in thick jungle, and evidently truly wild, but also planted. Bukit Timah, Chan Chu Kang.

*Fl. cataphracta* Roxb. "Rukam." A similar tree with smaller leaves. I do not think it is wild though often cultivated and established here and there. It a much better eating fruit than the last.

*Fl. inermis* Cl. A larger tree, quite unarmed, with thinner narrower leaves. Jurong and Tanjong Karong.

*Ryparosa Hullettii* King. A small tree with slender spikes of green flowers. Rare in forests. Bukit Timah, Sungei Buloh.

#### PITTOSPORACEAE.

*Pittosporum ferrugineum* Ait. "Giramong." A small tree with yellowish white flowers. Sea shores, Kranji, Changi, Selitar.

#### POLYGALACEAE.

*Polygala hirsutistachya* Bl. A little prostrate herb with yellow flowers, growing in turf or sandy spots. Not common, Gardens, Macpherson Road.

*Salomonia caudoniensis* Lour. A small branched weed about 3 inches tall with pink flowers. Common in waste ground.

*S. oblongifolia* Dec. Rare, sandy spots, Changi.

*S. aphylla* Griff. A very small buff colored saprophytic plant with minute flowers. Rare, in dense wet woods. Chua Chu Kang.

*Trigoniastrum hypoleucum* Miq. Small tree, flowers white. Bukit Timah.

*Xanthophyllum*. Large or small trees, with white or pink flowers and globose one or several seeded fruits. "Lama Beruk."

*X. paleobanicum* Miq. A small tree, with white flowers. Woods, Garden jungle, Selitar.

*X. obscurum* Benn. A large tree with dark green shining leaves, flowers white tinted with rose. Fruit as large as a cricket ball, greyish green with a very thick woody rind orange color inside, and numerous seeds. Woods, Tanglin.

*X. ellipticum* Korth. A medium sized tree with deep green leaves. Flowers at first white then yellow, with a red calyx. Drupe globular orange turning dark red, with a sweet but rather soapy taste. Tanglin, Changi.

*X. affine* Korth. A small to medium sized tree, flowers white. The commonest species in the peninsula, but not common in Singapore. Woods, Bukit Mandai, Jurong, Bukit Timah.

*X. Kunstleri* King. A fair sized tree with dark green leaves, and golden buds, flowers white, fertilized by bees. Not common. Tanglin.

#### PORFULACACE.E.

*Portulaca oleracea* L. Purslane. A common succulent prostrate weed with yellow flowers. Waste ground.

*P. quadrifida* L. A much smaller plant with tufts of white hair on the joints of the stem. Common in and round the town, on the wharfs, etc.

#### HYPERICINE.E.

*Hypericum japonicum* L. Small herb with yellow flowers. Pepper plantations, Bukit Mandai, Chua Chu Kang.

*Cratoxylon polyanthum* Korth. Tree with loose red bark, flowers pink. Woods, Bukit Timah, Changi, Chan Chu Kang.

*C. formosum* Benth. A beautiful tree flowering twice a year. The flowers rose-pink, appear abundantly when the tree sheds its leaves. The leaves are red when just open, gradually becoming green. Common in open country, Tanglin, Bukit Mandai, Chua Chu Kang, Bukit Timah.

*C. arboreus* Bl. "Geronggang." A big tree 50 to 60 feet, flowers in panicles deep crimson. Woods, Garden jungle, Bukit Timah, Seliutir.

#### GUTTIFER.E.

*Garcinia engeniaefolia* Wall. Tree, flowers white, sweet. Woods, Sungai Tengeh, Changi, Chan Chu Kang, Pulau Ubin, Tanjong Gol.

*G. rostrata* Benth. Flowers white or pink. Woods, Sungai Morai, Chan Chu Kang, Changi.

*G. cuspidata* King. Rare, Kranji.

*G. Hombrouiniana* Pierre. The peach-flavoured mangosteen. The tree resembles the common mangosteen, but the flowers are cream colored, the fruit smaller crimson, with a short beak on which is an entire dotted stigma, the rind is thin and scented like an apple, the pulp acid and scanty but peach-flavoured. Seashores, more rarely inland, Blakang Mati, Chan Chu Kang, Changi, Pulau Ubin.

(*G. mangostana* L. The mangosteen cultivated everywhere. A wild or reverted form with smaller more acid fruits, occurs near villages.)

*G. atrorividis* Griff. "Asam Gelugur." A beautiful tree, leaves bright red when young, deep green when old. Flowers large red. Fruit large succulent, flattened at both ends, and grooved all round, orange color stigma and persistent sepals red. It is dried in the sun and used in curries. It makes excellent preserves and pies. Doubtfully wild here. Tanglin, Tanjong Penjuru.

*G. Griffithii* T. Anders. "Kandis Gajah." Tree with large leaves. Flowers hardly opening greenish yellow. Fruit resembling an apple in form and color, acid, but eatable when cooked. Common in woods. Tanglin, Bukit Timah, Blakang Mati, Chua Chu Kang.

*G. Bancana* Miq. Tidal rivers, Kranji, Selitar.

*G. nigrolineata* Pierre "Kandis." Tree, unisexual, flowers small yellow, fruits small globose orange, eatable. Common, Woods and open country, Changi, Tengeh, Sungai Morai.

*G. parrifolium* Miq. Garden jungle.

*G. Forbesii* King. Small tree, flowers cream or pink, fruits small crimson, eatable. Not very common, Garden jungle, Bukit Mandai, Chua Chu Kang.

*G. nereos* Miq. Rare, Pulau Ubin, Serangoon Road.

*G. dulcis* Kurz. "Mandu." Probably not wild here. Gardens and villages.

*Culophyllum*. Trees with white flowers and green or purplish drupes.

*C. pulcherrimum* Wall. Common, Garden jungle, Changi, Kranji.

*C. spectabile* Willd. "Bintangor Bunut." Garden jungle, Bukit Timah, Selitar.

*C. retusum* Wall. Singapore, (Wallich).

*C. canum* Hook. fil. Not common, Tanglin, Bukit Mandai.

*C. inophyllum* L. "Penaga." Common on the sea shore. Bajau, Pulau Selitar, Pulau Ubin.

*C. inophylloide* King. Rare, Garden jungle, Changi.

*C. Wallichianum* Planch. "Bintangor Merab." Bukit Timah Chua Chu Kang.

*C. Griffithii* T. Anders. Rare, Sungei Morai.

*C. macrocarpum* Hook. fl. Changi.

#### TEENSTRÖMIACEAE.

Trees with white or pink flowers usually rather small with many stamens.

*Adinandra dumosa* Jack. "Tiup-Tiup." A very common tree about 20 feet tall, with white flowers, which are fertilized by bees and wasps, and the pulpy fruit eaten by bats. Open country everywhere.

*A. Hulletti* King. Not common, Garden Jungle, Selitar.

*A. acuminata* Korth. Woods, Garden jungle, Sembawang, Chan Chu Kang.

*A. vacuosa* T. Anders. Rare, North Selitar.

*A. miquelii* King. "Kwak." A very different looking tree with thick leaves and larger white flowers, and fruits of a Teruströmia. Edges of Mangrove swamps, local, North Selitar, Changi, Sungei Morai, also woods, Bukit Timah.

*A. sp.* "Mongol." Rare, Bajau (4004).

*A. near integrifolia* but less hairy. A big tree, Changi.

*Ternstroemia penangiana* Choisy. A big dense tree with dark green leaves and white flowers. Fruit egg-shaped about  $1\frac{1}{2}$  inch long orange, splitting and showing 3 or 4 seeds enclosed in a red pulp. Dry woods near the sea. Bajau, Toas, Batu Putih, Changi, Pulau Tekong.

*Sarcoja tristyla* Miq. Fern valley, Bukit Timah.

*Pyrenarior acuminata* Planch. A small tree with inconspicuous white flowers and small globular apple-like green fruits. Thick woods. Common, Bukit Timah, Tanglin.

*P. Kunstleri* King? Rare, Selitar.

*Gordonia excelsa* Bl. A tall tree with flowers like those of the tea plant but larger. Fruit a long woody capsule containing thin winged seeds. Rare, Selitar.

Var. with much larger coriaceous leaves, larger flowers and fruits. A very different looking tree, but referred by Dr. King to the same species. Common, Tanglin, Holland Road, Jurong, Changi.

*Archytia Vahlii* Choisy. "Riang-Riang." A bush or tall slender tree with pretty pink or white flowers. Common in secondary jungle. Tanglin, Jurong, Changi, Blakang Mati.

#### DIPTEROCARP.E.

Tall, often vast trees, with straight bare stems. Flowers large or small pink white or yellow, very sweetly scented. Fruit usually with two to four of the calyx lobes developed into long wings, by which the fruit drifts away from the tree in the jungle. The trees usually flower only once in five years. Very few flower annually. They supply good and useful timber, and the resin known as dammar and used for torches, and varnish, &c. Some also produce wood oil.

*Dipterocarpus coriaceus* Dyer. "Minyak Keruing." One of the best wood-oil trees, even the fruits are often full of oil. Woods, Changi, Bukit Timah.

*D. Hasseltii* Bl. Bukit Timah.

*D. grandiflorus* Blanco. This has very large winged fruits, 6 inches or more long, red. Bukit Timah.

*Anisoptera glabra* Kurz. "Mersawa." Garden jungle.

*A. costata* Korth. A gigantic tree with coppery looking leaves. Garden jungle, Dalvey, Bidadari.

- Hopea Pierrei* Hance. "Merawan." A tall straight tree with very small deep crimson flowers. Bukit Arang.
- H. Griffithii* Kurz. Garden jungle (No 4738).
- H. micrantha* Hook. fil. Singapore (Cantley).
- H. Mengarauan* Miq. A gigantic tree measuring as much as 18 feet in circumference. Common, Bukit Timah, Chan Chu Kang.
- Shorea grattissima* Dyer.\* Flowers white. Common, Garden jungle, Kranji, Chan Chu Kang.
- S. macroptera* Dyer. "Kepong." The bark is used for building houses. Common, Garden jungle, Chan Chu Kang.
- S. parcifolia* Dyer. "Meranti daun Kechil." Bukit Timah, Garden jungle.
- S. gibbosa* Brandis. Flowers pink, Garden Jungle.
- S. leprosula* Miq. "Sernayah batu." very common, Garden Jungle, Bukit Timah.
- S. rigida* Brandis.\* Flowers white. Rare, Garden Jungle.
- S. pruiciflora* King. Flowers yellow, Garden Jungle.
- S. bracteolata* King. Dalvey Road (No. 1827).
- Cotylelobium faram* Pierre. Rare, Sungai Morai.
- Vatica Ridleyana* Brandis. Common, Garden Jungle, Bukit Mandai, Changi.
- Poecyllocarpus Wallichii* King. "Damar Mata Kuching." Common, Garden Jungle, Kranji, Changi, Toas.

#### MALVACEÆ.

- Herbs shrubs or trees with showy flowers.
- Sida*. Small shrubby plants with yellow flowers.
- S. carpinifolia* L. Common everywhere in waste ground.

*S. rhombifolia* L. "Silaguri Padang." A common weed used in native medicine for tooth-ache. Sepoy lines, Chan Chu Kang.

*Abutilon indicum* Don. Weed in waste ground. Alexandra Road, Pulau Ubin.

*Urena lobata* L. "Pulut-pulut." A very common weed with pink flowers opening in the early morning. The leaves are used for adulterating Patchouli, and it is cultivated for its fibre in America, where it is called Cesar-weed. Common in open dry spots; the variety *sinuata* with deeply lobed leaves occurs more usually near the sea.

*Hibiscus*, several species are cultivated, including *H. rosa-sinensis* L. the Shoe-flower, "Bunga Rayah," the flowers of which are used for blackening leather, and for coloring sweet-meats red. *H. abelmoschus* L. the Musk seed, "Kapas hantu," with large yellow flowers with a maroon centre, occurs cultivated and half wild. *H. Sabdariffa*, "Rosella," used as a vegetable or preserve. *H. esculentus* L. "Lady's fingers."

*H. surattensis* L. A prickly climbing or creeping plant, with yellow flowers and a maroon eye. Tanglin, Changi, Pulau Ubin.

*H. tiliaceus* L. "Baru." A common sea-coast tree with large yellow flowers with a maroon eye, turning pink soon after opening. All round the coast.

*Thespesia populnea* Corr. Tree very similar to the last. Sea coasts, common, Toas, Chan Chu Kang, Pulau Ubin.

(*Eriodendron anfractuosum* De C. The tree Cotton, "Kapok." Cultivated.)

(*Durio zibethicus* L. The Durian. Cultivated.)

*D. oblongus* Mast. A wild Durian, with green uneatable fruits. Woods, scarce, Bukit Timah, Bukit Mandai.

*Nessia synandra* Mast. The woody Durian. A big tree, with rather small flowers and large wooden blue-grey fruits,

which partly open, the walls inside are covered with yellow stinging hairs. The seeds are black with a yellow waxy aril. Rare, Bukit Timah, Chan Chu Kang, Kranji, Chua Chu Kang.

*Cocostegia Griffithii* Benth. "Punggai." A very big tree with small flowers on the old wood and large round woody fruits, the outside, covered with thorns, is black, the inside brilliant orange. The bark is used in tanning. Rare, Bukit Timah, Garden Jungle.

*Boschia Griffithii* Mast. "Durian-Durian." A medium sized tree with small white flowers and little scarlet durians. Rare, Garden Jungle, Bukit Timah.

#### STERCULIACEÆ.

*Sterculia macrophyla* Vent. A big tree with large red pods. Rare, Reservoir Woods, Chan Chu Kang.

*S. beris* Wall. A shrub or small tree with green flowers and scarlet pods which split open into 3 to 5 lobes in the form of a star, and show the oblong blue-black seeds suspended all round the margin. Woods, common, Tanglin, Bukit Timah, Pulau Ubin, etc.

Var with very narrow leaves. Chan Chu Kang, Bukit Mandai, Bukit Timah.

*S. rubiginosa* Vent. A small or medium sized tree very showy in fruit, flowers pink. Common, Tanglin, Bukit Timah, etc.

*S. parviflora* Vent. Big tree, Garden Jungle.

*S. scaphigera* Wall. "Kembang Samangko." A very large tree, often over 100 feet tall. The fruit in the form of a long green boat containing an oblong seed at one end. When the seeds are put into water the outer coat swells up and becomes mucilaginous, and this mucilage is eaten with sugar in the morning to cool the blood. Rare, Bukit Mandai.

*Torrieta simplicifolia* Mast. A vast tree. Not common, Dalvey Road, Bukit Timah.

*Heritiera littoralis* Dryand. "Dungun." Sea shores, common, Rajau, Kranji, Pulau Tekong.

*H.* sp. Lofty tree in jungles. Garden jungle. Apparently undescribed.

*H. James* Buch. Ham. Mangrove swamps. Kranji.

*Pterospermum diversifolium* Bl. A gigantic tree, Pulau Ubin.

*Pt. Blumenauum* Korth. "Bayur." A big tree, dense woods, common, Bukit Timah, Sungei Buluh.

*Melochia corchorifolia* L. A common weed with small pink flowers. Waste ground everywhere.

[*Pentapetes phoenicea* L. A tall herb with deep red flowers. Waste ground, Tanglin, Blakang Mati.]

*Buttneria Maiangai* Mast. "Akar Kachubong." A big woody climber with curious little white and pink flowers and round prickly capsules. Common, Garden Jungle, Changi, Bukit Mandai, etc.

*B. Jackiana* Wall. Singapore, King's Materials. Not seen, probably an error.

*Commersonia platyphylla* Andr. "Durian Tupai." A common tree with white flowers, in large cymes and bristly capsules. Open country Tanglin, Jurong, etc.

#### TILIACEÆ

*Brownlowia lanceolata* Benth. Rare, "Mangroves, Kranji."

*Pentace triptera* Mast. "Sepa Petri." Medang Serai." A gigantic tree with white flowers. Woods, common. Bukit Timah, Ang Mo Kio, Chua Chu Kang.

*Grewia umbellata* Roxb. A stout climber with white flowers. Common, Tanglin, Galang, etc.

*G. fibrocorpa* Mast. Small tree with orange fruits. Rare, Cluny Read

*G. latifolia* Mast. A large shrub with orange pear-shaped fruits about an inch long, and pleasantly flavoured. Flowers yellow. Tanglin, Bukit Timah, Chan Chu Kang.

The absence of the common peninsular shrub *G. paniculata* Roxb. is very remarkable.

*Triumfetta rhomboidea* Jacq. A common weed with small yellow flowers and prickly fruit. Waste ground, Tanglin, Changi, etc.

*T. pilosa* Roth. Singapore (King) not seen.

(*Corchorus capsularis* L. "Jute." Bukit Timah (Dr. King).

*C. acutangulus* Law. Weed with yellow flowers, rare. Chan Chu Kang.

*Echinocarpus* sp. Tree with white flowers in axillary panicles. Very rare, Kranji (No. 6174).

*Elaeocarpus*. Trees with white flowers, often showy, and blue or green drupes. "Mendong."

*E. gasistrus* Roxb. Cultivated only. The globose oily blue fruits contain a hard tubercled seed much in request by Tamils as a bead. It is usually 5 grooved, but very rarely a 6 grooved one is found, which commands as high a price as 5 dollars.

*E. porcifolius* Wall. Common, Tanglin, Changi, etc.

*E. stipularis* Bl. Very common, Tanglin, etc.

*E. salicifolius* King. "Jurunong Padi." Not common, Bukit Timah, Selitar.

*E. paniculatus* Wall. Common. Kranji, Bukit Mandai, Selitar.

*E. petiolatus* Wall. Common, Tanglin, Selitar, Changi.

*E. Griffithii* Mast. Common, Tanglin, Selitar.

- E. Hullettii* King. Not common, Bukit Timah, Bukit Mandai.
- E. pedunculatus* Wall. Sea shores, Loyang, Toas, Jurong, Pulau Tekong.
- E. apiculatus* Mast. Rare. Bukit Timah Road.
- E. polystachys* Wall. "Jurunong Babi." Flowers buff, common in woods, Bukit Timah, Jurong, Teban, Changi.
- E. Jackianus* Wall. Not rare, Tanglin, Selitar, Bukit Mandai.
- E. Masterii* King. Common, Tanglin, Bukit Timah, Kranji, Changi.
- E. sp. near E. polystachys*. Rare, Bukit Timah (4949, 3641)

## LINEÆ.

*Rouheria Griffithiana* Planch. Climber, with yellow flowers, and small red drupes. Common in thickets and woods. Tanglin, etc.

*Erythrocyanus burmanicum* Griff. A tree. Common near the sea.

*Leonanthes icosandra* Jack. "Pagar Anak." Tree. Common, Tanglin, etc.

*I. reticulata* Jack. Less common, Woods, Garden Jungle, Bukit Timah, Bajau, Jurong.

## MALPIGHIACEÆ.

*Tristellateia australasicæ* Rich. A slender climber, flowers yellow. Common by tidal rivers, and often cultivated. Toas, Kranji, Changi, Pulau Ubin.

*Hiptage sericea* Hook. fil. Scandent, but forming bushes in open sandy spots. Flowers pink and white. Rare, Changi, Bukit Mandai road.

*Aepidopterys concava* Juss. Climber, Forests, Bukit Mandai, Chan Chu Kang.

## GERANIACEAE.

(*Oxalis corniculata* L. A garden weed, common.)

(*Averrhoa Bilimbi* L. the Blimbang, and *A. Carambola* L. "Kembola," are cultivated.)

*Connaropsis macrophylla* King. Tree, flowers crimson. Not common, Selitar

## RUTACEAE.

A number of these are cultivated, among which are Rue (*Ruta graveolens*) the Kawuning (*Murraya exotica*) of the ornamental wood of which the sheaths and handles of Kises are made, the Lime berry, "Limau Keab" (*Triphasia trifoliolata*), the pumelo (*Citrus decumana* L.), orange (*Citrus aurantium*), various Limes (*Citrus medica* L.)

*Erodia Borburghiana* Benth. "Stenga burong." A shrub with white flowers. Common in open country, Tanglin, Bedoh, Kranji, Jurong, Bukit Timah.

*E. glabra* Bl. A fine tree. Local, but not rare, Tanglin, Bukit Timah, Chan Chu Kang.

*E. robusta* Hook. fil. A tall tree, very conspicuous in flower. Not rare, Reservoir, Tons, Bukit Mandai.

*E. pedunculosa* Hook. fil.\* A very little known plant, said to have been collected in Singapore by Lobb.

*Zanthoxylum ocolifolium* Wight. Wallich No. 7469, not seen.

*Acronychia Porteri* Hook. fil. A tree, usually small. Flowers and fruits green. Woods, common, Garden jungle, Bukit Timah, Changi, Jurong, Chan Chu Kang.

*Glycosous pentaphylla* Corr. Common in woods and forests, a large shrub, flowers and fruits white. Garden jungle, Bukit Timah, Kranji, Selitar, etc; a broad leaved form. A narrow leaved one occurs at Changi.

*Micromelum hirsutum* Oliv. Wallich (No. 8156 c.) Not seen.

*Clausena excavata* Burm. A small tree with white flowers,

strongly scented foliage and semitransparent pink fruits.  
Doubtfully wild. Open country, Tanglin, Pulau Ubin.

*Lucuna eleutheranthera* Dalz. Climber, very rarely flowering.  
Changi, Bukit Timah.

*Paramignya grandiflora* Oliver. Very rare, Changi (Hullett);  
also collected by Lobb.

*P. longispina* Hook. fil. "Limau Lelang." A thorny shrub  
with curious pear-shaped orange aromatic fruits used in  
native medicine. Near mangrove swamps, Kranji, Jurong.

#### SIMARUBACEAE.

*Brucea sumatrana* Roxb. A shrub with aromatic foliage small  
purple flowers and black berries. Wallich (No. 8482).  
I have never seen this here, but on introducing some  
plants from Pahang, it established itself all about Tanglin,  
the seeds being borne about by birds.

*Eurycoma longifolia* Jack. "Bidara Pahit." An elegant shrub  
with a very bitter bark used in medicine against fever.  
Common in dry woods, especially near the sea. Tanglin,  
Changi, Bukit Timah, Blakang Mati, etc.

*Irrigia Malayana* Oliver. "Panah Kijang." A gigantic tree  
over 100 feet tall, with small green flowers, and fruit like  
mangoes, green with an orange pulp. Tanglin, Reservoir  
woods, Bajau, etc.

#### OCHNACEAE.

*Gomphia sumatrana* Jack. Tree, flowers yellow. Common,  
Bukit Timah, Kalang, Toas, Changi, Pulau Ubin.

*G. Hookeri* Planch. Flowers deep red. Less common, near  
the sea. Changi, Tanjong Gol, Bukit Timah.

*Tetramerista glabra* Miq. Wallich (No. 1055). Not seen.

*Euthemis leucocarpa* Jack. An under shrub, very elegant with  
white flowers, and rosy, scarlet or white berries. Common in sandy woods. Kranji, Changi.

*E. minor* Jack. Singapore, according to Jack. I have only found it at Pulau Battam, south of Singapore.

BURSERACEÆ.

*Trionma malaccensis* Griff. A big tree exuding a very aromatic turpentine, fruit green three-winged, containing three oval flat-winged seeds. Not common, Garden Jungle, Bukit Timah.

*Casuarina Planchonii* King. Not common, Bukit Mandai.

*C. grandiflorum* Benn. Flowers orange. Rare, Changi (Hullett), Bukit Mandai.

*C. pilosum* Benn. "Kedondon Krot." Not common, Changi.

*C. rufum* Benn. "Kedondon Bulan." A medium sized tree with creamy yellow flowers and large hard glaucous green fruits tasting of turpentine, with a triquetrous seed. Not rare, Tanglin, Selitar.

*C. purpurascens* Benn. Not common, Bukit Timah, Changi, Chan Chu Kang.

*C. Kadondon* Benn. "Tinou." Big tree, fruit erect pink. Garden jungle, Bukit Timah, Changi.

*C. secundum* Benn. Not common, Changi Road, Tanglin, Selitar.

*C. nitidum* Benn. Open woods, common, Changi Reservoir woods, Bukit Timah.

*Trigonocheilus Griffithii* Hook. fil. "Kumpas Ruman." Tanjong Gol. Kranji, Selitar.

*Santiria laxa* King. A large tree with a spreading head. Flowers in lax hanging hairy panicles deep red. Drupes plum-like rosy. A beautiful tree when in fruit. Garden jungle, Bukit Timah.

*S. laevigata* Bl. "Kerantei." A large tree, flowers green. Not rare, Selitar, Garden jungle, Bukit Mandai.

*S. apiculata* Benn. Flowers greenish white, fruits rosy. Bajau, Bukit Timah.

*S. multiflora* Benn. Not common, Selitar.

#### MELIACEAE.

*Sandoricum radiatum* King. "Kechapi." Cultivated for its fruit. Wild on Pulau Ubin in thick woods.

*S. indicum* Lam. "Sentol." Cultivated commonly.

*Chisocheton pauciflorus* King. Thick woods, not common, Bukit Timah.

*Ch. erythrocarpus* Hiern. Not common, Pulau Ubin.

*Ch. macrophyllus* King. Rare. A big tree, Pulau Ubin.

*Ch. patens* Bl. A big tree with long racemes of white flowers, very fetid. Common, Garden jungle, Bidadari, Changi, Selitar.

*Diospyros acutangulum* Miq. A tree with large orange-colored pear-shaped fruits. Changi.

*D. costulatum* Miq. A large tree, flowers white. Not rare, Changi, Chan Chu Kang, Bukit Timah.

*D. macrothyrsus* Miq. Selitar.

*D. caulinflorum* Hiern. A medium sized tree with white flowers on the stem, scented of almonds, and red capsules, containing black seed with a red aril. Common in thick woods, Changi, Chan Chu Kang, Bukit Timah, Pulau Ubin.

*D. turbinatum* King. Rare, Bukit Timah (8108).

*Amoora Aphananixis* Schultes. Not rare, Toas, Bukit Mandai, Selitar.

*A. rubiginosa* Hiern. A superb tree, over 100 feet high, the leaves of a copper color beneath, flowers rose. Jungles, Chan Chu Kang.

- A. caecillata* Roxb. Tree, flowers yellow. Selitar (3778, 4575).
- A. rubescens* Hiern. Singapore (Maingay), Selitar.
- (*Aglaia odorata* Lour. Cultivated for its sweet flowers.)
- A. oligophylla* Miq. Singapore. Wallich (No. 4887). Not seen.
- A. glabriiflora* Hiern. Small tree, leaves deep shining green, flowers and fruits white. Local. Garden Jungle, Changi.
- A. odoratissima* Bl. Tree, flowers yellow. Not rare, Bukit Mandai, Chan Chu Kang, Bukit Timah, Reservoir Woods.
- A. cordata* Hiern. Rare, Selitar.
- A. tenuicaulis* Hiern. Singapore (Lobb), perhaps an error.
- A. trichostemon* Dec. Rare. Garden Jungle.
- (*Laurum domesticum* Jack. The Duku; cultivated.)
- Caripa oblongata* Bl. "Nireh." A big tree, with sweet white flowers and large globular fruits, with corky seeds. The bark is used in medicine for dysentery. Mangrove swamps, very common, Kranji, Serangoon, etc.

## CHAILLETIACE.

*Chailletia deflexifolia* Turez. A climbing or scrambling shrub, flowers white. Rare, Bajau.

## OLACINEÆ.

*Ochanostachys amentacea* Oliver. "Petaling." A well known timber tree with leaves like those of a beech-tree, small spikes of green flowers, and green fruit with much white milk. Common, Garden Jungle, Changi, Reservoir woods.

*Strombosia rotundifolia* King. Woods, Bukit Timah, Garden jungle, Bukit Mandai.

*Lepianthus sylvestris* Bl. A small shrub, Garden jungle, Bidadari.

*Ctenododon parvifolius* Oliver. Rare, Garden jungle.

*Ximenesia americana* L. "Bidara Laut." A spiny shrub with white flowers and orange eatable drupes. The wood is scented. Sea coasts, Changi, Pulau Selitar, Jurong, Pasir Panjang.

*Scorodocarpus borneensis* Becc. "Kulim" A large timber tree with white flowers, all parts having a strong smell of onions. Common, Garden jungle, Bukit Timah.

*Gomphandra penangiana* Wall. A shrub common in woods, Bukit Timah, Garden jungle, Tanjong Katong, Selitar.

*G. lanceolata* Kurz. Not common, Bukit Timah.

*Lasianthera secundiflora* Miq. A large tree, flowers white. Rare, Bukit Mandai, Selitar.

*Gonocaryum longeracemosum* King. "Toioh." A large straggling shrub, with pendulous racemes of purplish green flowers; fruits green. Woods, not rare. Tanglin, Changi.

*Phytocrene oblonga* Wall. A large woody climber with dense racemes of small grey flowers growing on the stem, fruit wedge-shaped brown covered with brown bristles and forming a ball as big as a man's head. The seeds are cuneate oblong and curiously reticulated. Rare, Bukit Timah.

*Ph. bracteata* Wall. Common, open woods, Tanglin, Tanjong Katong, Bukit Panjang.

*Iodes velutina* King. Climber. Rare, Bukit Timah Road.

*I. oblonga* Planch. Not rare, Bidadari, Chan Chu Kang, Garden jungle.

*Erythropalum scandens* Bl. A slender climber with inconspicuous green flowers, and very curious and ornamental fruit, which at first is an oval drupe, but when ripe the husk becomes bright red and splits into 4 lobes, which recurve and expose a deep blue seed in the centre. Not common, woods, Bukit Mandai, Reservoir woods, Garden jungle.

*Pteleocarpa malaccensis* Oliver. A fair sized tree, flowers yellow, fruit round thin, winged. Rare, Changi woods.

## ILICINEÆ.

*Hes cymosa* Bl. A small or medium sized tree with very white bark, more rarely a bush. Flowers very small and green. "Timah-Timah" or "Titimah." Common in open country, Tanglin, Changi, Chan Chu Kang.

*I. macrophylla* Wall. Usually a smaller plant with larger leaves. Common, Garden jungle, Ang Mo Kio, Changi, Kranji.

## CELASTRINEÆ.

*Euonymus javanicus* Bl. A large shrub. Woods, rare, Kranji, Sunbwang.

*Glyptopetalum quadrangulare* Prain. Not common, Changi beach, Chan Chu Kang.

*Kokoona littoralis* Laws. Singapore (Lobb). Not seen.

*Lophopetalum fimbriatum* Wight. "Krabu." A tree with yellow petals and the central disc purple. Rare, Bukit Mandai, Changi.

*L. Curtissii* King. A gigantic tree, rare. Bukit Mandai, Chua Chu Kang.

*L. succescens* Kurz.\* Singapore. (Anderson.) Not seen.

*Kurrimia pulcherrima* Wall. A tall tree with small red flowers. Not common, Bukit Mandai, Gardens.

*K. paniculata* Wall. A large handsome tree with dark green leaves and panicles of small green flowers, with an unpleasant smell. Much frequented by flies. Fruit a heart-shaped red capsule. Common in dry woods, Tanglin, Chan Chu Kang, Bukit Mandai, etc.

*Hippocratea indica* L. A climber with very small white flowers. Local in sandy spots, Changi, Pulau Ubin.

*H. Cumingi* Laws. "Akar Biutang." Climber, flowers yellow. Sea coasts, Sungai Pandan, Kranji, Selitar.

*Salacia grandiflora* Kurz. "Ampedal Ayam." A shrub half scandent, gnarled, with black stems, small pearly flowers, and eatable orange coloured fruits. Woods and open country, Bukit Timah, Pulau Ubin, Changi, Toas.

*Var. longifolia*, Changi.

*S. latifolia* Wall. Singapore (Wallich No. 4222). Not seen.

*S. prinooides* De C. A slender climber (a large straggling shrub according to King), with very small brown flowers and small globular orange fruits. Not common. Garden jungle, Bukit Timah Road, Pulau Ubin.

*S. flavescentia* Kurz. A climber with yellow or reddish flowers. Not common, Bukit Timah, Tanglin, Changi.

*S. longiflora* Hook. Half scandent shrub with buff flowers. Changi, rare.

*S. sp. near flavescentia*. Rare, Changi (4785).

*S. Lobbii* Laws.\* "Singapore Lobb." Not seen, very imperfectly known.

*Celastrus Championi* Benth. var? Sungei Loyang.

#### RHAMNÆ.

*Ventilago leiocarpa* Benth. A slender much branched climber with small green flowers, and small round fruit with a long narrow wing. Common. Garden jungle, Bukit Timah, Pulau Ubin.

*V. madraspatana* Gaertn. Rare. Bukit Mandai.

*Zizyphus anoplia* Mill. A scandent thorny bush. Not common. Orchard Road.

*Z. elegans* Wall. (Wallich No. 4233). Not seen.

*Z. calophylla* Wall. A large climber very thorny dark green polished leaves, small white flowers and orange globose eatable fruit. Very common, Garden jungle, Bukit Timah, Selitar, etc.

*Var.* with small leaves, and smaller fruits. Selitar.

*Z. Horsfieldii* Miq. Rare, Bukit Timah.

*Colubrina asiatica* Brongn. A shrub with green flowers. Sea coasts, Galang.

*Smythea reticulata* King. Climber. Not common, near the sea, Toas, Serangoon.

#### AMPELIDÆ.

*Vitis macrostachya* Miq. Hedges, common, Tanglin, Bukit Timah, Jurong.

*V. gracilis* Wall. Very common, Changi, Reservoir, Tanglin, Selitar, etc.

*V. cinnamomea* Wall. Not very common, Chan Chu Kang, Reservoir, Bukit Mandai.

*V. polythyrea* Miq. Rare, Changi.

*V. elegans* Kurz. Hedges and borders of woods. Very common, Tanglin, Jurong, etc.

*V. Lawsonii* King. A big climber with large yellow grapes quite eatable. Woods, Bukit Timah, Garden jungle.

(*V. quadrangularis* Wall. An odd four-angled stemmed vine, with very few leaves; not native, but cultivated here and there.)

*V. furcata* Laws. A long vine with flat stems 4 angled green with thick bands of brown cork along the edge, grapes black. Common in dense woods, Bukit Timah, Bukit Mandai, Tanglin, etc.

*V. repens* W. and Arn. Hedges, Fort Canning, Chan Chu Kang.

*V. cerasiformis* Teysm. Bukit Timah.

*V. glaberrima* Wall. A succulent vine with grey four angled stems and red tendrils, berries black. Very common in hedges. "Asam Riang". Tanglin, Changi, etc.

*V. mollissima* Wall. "Lakon Gajah." A hairy vine with trifoliate leaves and large dirty white grapes. Common, Cluny Road, Sungei Buluh, Reservoir woods.

*V. trifolia* L. Very common, hedges, Reservoir, Race Course, Kalang Puding.

*V. Japonica* Thunb. "Singapore." Not recognised.

*V. novemfolia* Wall. A slender vine with large semitransparent pink grapes, quite uneatable. Common, Tanglin, Chua Chu Kang.

*V.* sp. Leaves simple, flowers very small green in axillary panicles, crowded at the ends of the branches. Rare, Selitar.

*Pterisanthes coriacea* Korth. A very slender vine remarkable for its long flattened crimson flower spikes 3 or 4 inches long one or 2 wide; female flowers small sunk in the spike, males on stalks along the edge, grapes black. Local in thick woods, Chua Chu Kang, Bukit Mandai, etc.

*Leea*. Large shrubs with green or red flowers in corymbs. "Malli-malli".

*L. umbellata* Willd. Six to ten feet tall, flowers greenish white. Very common in damp spots. Tanglin, Bukit Timah, Selitar.

Var. *biserrata*. Chua Chu Kang.

*L. robusta* Roxb. Rare, Blakang Mati.

*L. rubra* Bl. A smaller plant with red flowers, very pretty. Tanglin, perhaps introduced.

*L. Javanica* Bl. Singapore (Schomburgk). Not seen.

*L. angulata* Korth. "Malli biduri." Passir Panjang.

#### SAPINDACEÆ.

*Cardiospermum Halicacabum* L. the Balloon vine, is cultivated by the Chinese as a vegetable, and occurs in waste ground. Pulau Ubin, Rochore.

*Allophylus Cobbe* L. A sea shore shrub with white flowers and red berries. The var. *racemosa* is the only one here. Common, Kranji, Selitar, Jurong, Alexandra Road.

*Erioglossum edule* Bl. "Mertajam." A tree, with small black unpleasantly flavoured fruits. Common, especially near town. Government Hill, Pulau Ubin.

*Xerospermum muricatum* Radlk. "Rambutan Pachat." A small tree, flowers white, fruit yellow roughened outside, seed enclosed in eatable pulp. Common, Tanglin, Bukit Mandai, Bukit Arang.

*X. Wallichii* King. Singapore, Wallich (not seen).

*Nephelium lappaceum* L. "Rambutan." *N. Longana* Camb.; "Mata Kuching;" *N. chrysanthemum* Bl. "Pulassan," are cultivated.

*N. glabrum* Noronha. "Redan." Fruits warty red, acid. Tanglin, Chan Chu Kang, Toas.

*N. rufescens* Hiern. Chan Chu Kang.

*N. eriopetalum* Miq. A beautiful tree with white flowers in hanging spikes, and scarlet fruit like rambutans. "Sunggol Lotong." Bukit Timah, Garden Jungle.

*Pometia gracilis* King. Woods, Bukit Timah.

*P. alnifolia* Radlk. Chan Chu Kang, Bukit Mandai.

*Guioa pleuropteris* Radl. Tree, flowers white. "Simpayan Ular." Common, Bentley's hill (Hullett), Bukit Timah, Selitar.

*G. squamosa* Radl. Bukit Timah, Selitar.

*G. pubescens* Radl. Very common everywhere.

*Trigonachrus acuta* Radl. Rare, Bukit Timah.

*Argytera littoralis* Bl. var. *Major*. A shrub or small tree. Sea-coasts, Chua Chu Kang.

*Mischocarpus fuscescens* Bl. Bukit Panjang, Pulau Ubin.

*M. sundaeus* Bl. Tampenis, Serangoon, Changi.

*Paranephelium macrophyllum* King. Very large tree, with pink flowers, fruit woody covered with processes, brown dehiscent. Bukit Timah.

*Turpinia ponifera* De C. "Geritta." Medium sized tree, flowers and fruits green. Woods, Bukit Timah, Tanglin, Bukit Mandai.

#### SABIACEÆ.

*Meliosma elliptica* Hook. fil. Tree, rare. Chan Chu Kang.

*M. lanceolata* Bl. Small tree, not rare. Chan Chu Kang, Jurong, Bukit Mandai.

*M. Ridleyi* King. Common, Garden jungle, Bukit Timah. It also occurs in Johore, near Castlewood.

#### ANACARDIACEÆ.

*Buchanania florida* Schauer var. *lucida*. "Otak Hudang." Tree with white flowers. Common in open country and low woods, Tanglin, Changi, Kranji. Var. *petiolaris* not common, Selitar.

*B. sessilifolia* Bl. Common, Chan Chu Kang, Jurong, Tampenis.

*Bouea burmanica* Griff. "Ruminiya." A big tree with small acid orange mangos, common, wild and cultivated.

(*B. macrophylla* Griff. "Kedondong." Cultivated as a fruit tree.)

*Mangifera sclerophylla* Hook. fil. A gigantic tree. Rare, Bukit Timah, Changi.

*M. odorata* Griff. "Kohini." Bukit Timah, Toas; perhaps only cultivated.

(*M. foetida* Lour. "Bachang." Cultivated.)

*M. lagenifera* Griff. "Lanjoot." A magnificent tree, with purple

flowers and large grey pear shaped mangoes, very unpleasant to eat. Jurong, Blakang Mati, etc. Cultivated.

*M. kemanga* Bl. "Kemang." Probably only cultivated, rare.

*M. indica* L. "Mango." Cultivated.

*Anacardium occidentale* L. Cashew. "Gajus." Cultivated and often established. Common near the sea.

*Melanorrhoea Maisgoyi* Hook. fil. "Rengas Manau." A big tree with white flowers, and red 5-winged fruit. A well known timber. Common, Bukit Timah, Changi, Kranji, Selitar.

*Parashia pubescens* Hook. fil. A lofty tree, 150 feet tall, flowering before the leaves come out, flowers white. Very rare, Dalvey Road.

*P. paucijuga* Engler. Rare, Bukit Timah.

*P. Maisgoyi* Hook. fil. Garden jungle.

*Campnosperma Urifithii* Hook. fil. "Teruntang." A large tree, with big leaves especially when young. Common, Bukit Timah.

*C. auriculata* Hook. fil. Common in woods. Tanglin, Bukit Timah, Selitar, Teban.

*C. Wallichii* King. Dalvey Road, Bukit Mandai, Toas.

*Melanochyla auriculata* Hook. fil. A big tree, with very large stiff leaves and panicles of green flowers fertilized in the evening by brown cockchafers. Wet jungles, Chua Chu Kang.

*Dracentouelium mangiferum* Bl. Rare, Chua Chu Kang.

#### CONNARACEÆ.

*Connarus ferrugineus* Jack. A scandent shrub. Not common, Bukit Mandai.

*C. semidecandrus* Jack. A half scandent bush with lilac flowers, and red pods containing one black seed with a red aril. Dry open country, Toas, Changi, Selitar, Bukit Mandai.

*C. oligophyllus* Wall. Bukit Mandai, Changi.

*C. grandis* Jack. Local. Changi, Pulau Ubin.

*C. ellipticus* King. Bukit Mandai.

*Ellipanthus Griffithii* Hook. fil. A tree with small white flowers Garden jungle.

*Rourea acuminata* Hook. fil. Singapore, Wallich (8533). Not seen.

*R. pulchella* Planch. Lofty climber. Garden jungle, Changi.

*R. rugosa* Planch. "Semilat putih." Common, Changi Road, Selitar.

*R. parallela* Planch. Sungei Bulub, Changi, Kranji.

*R. fulgens* Planch. "Semilat." A tall slender climber with pink and white flowers. The young leaves of a beautiful pink, whence the specific name. A very beautiful plant. The bark is used by natives for colic. Very common, Tanglin, Bukit Timah, Teban.

*R. concolor* Bl. Not rare. Teban, Reservoir Woods, Chan Chu Kang.

*Agelora vestita* Hook. fil. "Akar Kachang-kachang." A climber with small pinkish flowers and red velvety pods. Common in forests, Tanglin, Sumbawang, Bukit Timah, Changi.

*A. Wallichii* Hook. fil. "Akar Kachang jantan." Changi.

*A. Hullettii* King. Local, Changi.

*Cnestis ramiflora* Griff. A climber with brilliant pink shoots, white flowers, and large pear-shaped red fruits. Common in dry woods and open country. Tanglin, Changi, Tanjong Penjuru.

## LEGUMINOSÆ.

*Abrus precatorius* L. A slender climber with pale lilac flowers and red and black seeds. A variety with white seeds occurs and is highly prized by the natives as a medicine. Sea shores, Changi.

*Crotalaria alata* Ham. "Kachang Hantu Darat." A herb with yellow flowers. Local waste ground, Tanglin, Changi, Jurong, Ang Mo Kio.

*C. retusa* L. A glaucous herb with showy orange yellow flowers. Sandy shores, Changi.

*C. Saltiana* And. A common weed in waste ground, and sandy places, yellow flowers. Changi, Galang, etc.

*C. quinquefolia* L. Rare, Kranji.

*C. incana* L. Flowers yellow. Sea shore, Tanah Merah.

*Flemingia strobilifera* Br. A shrub. Sea shores, not common, Changi, Blakang Mati.

*Vigna retusa* Walp. A small yellow vetch. Sea shores, Changi, Blakang Mati.

(*V. Catiang* End. "Kachang Perut Ayam." Cultivated.)

(*Pachyrhizus angulatus* Rich. "Bengkuang." "Sengkuang." The yam bean is cultivated.)

(*Dolichos Lablab* L. "Karkaras". Flowers blue or white, cultivated.)

*Psophocarpus tetragonolobus* De C. "Kachang Botor." Cultivated.)

(*Clitoreia Ternata* L. Cultivated.)

*C. cajanifolia* Benth. A shrub with large lilac white flowers, naturalised from Brazil, round Tanglin, etc. Very common.

*Centrosema Plumieri* Benth. The "Butterfly pea," climber, flowers white with dark crimson centre. Naturalised in hedges near town.

(*Canavalia ensiformis* De C. "Kachang Parang." Cultivated.)

*C. lineata* De C. A creeping bean with pink flowers sweet-scented, beans eatable. Sea shores, common, Changi, Blakang Mati.

*C. obtusifolia* De C. A climber on bushes, flowers pink. Beans said to be poisonous. Sea shores, Toas, Changi.

*Mucuna gigantea* De C. Climber, flowers greenish white. Not common, Blakang Mati.

*M. biplicata* Teysm. Flowers purple. Chan Chu Kang.

(*Erythrina stricta* and *E. lithosperma* Miq. are planted here and there, but not wild.)

*Spatholobus ferrugineus* Benth. "Akar Sejangat." A big liana, one of the best of the water vines, climbing to the tops of the highest trees, flowers deep purplish small. Common, Tanglin, Chan Chu Kang, etc.

*S. Maingayi* Prain. Flowers rosy. Woods, Bukit Timah, Garden jungle.

*S. Ridleyi* Prain. \* Big climber, flowers white. Gardens, Chan Chu Kang.

*Indigofera hirsuta* L. Sea shore, Teluk Kurau.

*Sesbania paludosa* Roxb. Rare. Marsh near Kranji.

(*S. grandiflora* Pers. Tree with large white or pink flowers. Cultivated for its flowers, and for the leaves eaten as a vegetable.)

(*Tephrosia candida* De C. given for Singapore in the "Materials," is only a garden plant.)

*T. Hookeriana* W. & A. Waste ground, Bidadari, probably an escape.

*Millettia eriantha* Benth. A lofty climber with coppery red flowers with a greenish yellow centre to the standard, outside covered with golden fur. Not very common, Bukit Mandai, Garden jungle.

- M. Maiagayi* Bak. A big climber with large hanging panicles of pink flowers deliciously scented. Pods oblong woody, about 4 inches long, one seeded, wrinkled and covered with fine grey fur. Not common, Tanglin, Chan Chu Kang, Reservoir woods.
- M. atropurpurea* Benth. is probably not wild here. A fine tree occurs in a garden in Paterson Road.
- Pongamia glabra* Vent. "Malapari." A tree with pink flowers. Common on the sea coasts. Changi, Siglap, Jurong, Pulau Ubin.
- Derris sinuata* Thw. Woody climber, flowers green and white. Tidal rivers, Pulau Ubin.
- D. thyrsiflora* Benth. Scandent bush, flowers in dense erect panicles, white, pods long and thin, reddish when white. Very common in open country, Tanglin, Changi, etc.
- D. uliginosa* Benth. "Akar Ketuil". Scandent shrub, flowers pink. Common on sea coasts and by tidal rivers Rivers Valley Road, Changi, Pulau Ubin, Kranji, Bajau.
- D. scandens* Benth. Flowers white. Pulau Merambong.
- D. amena* Benth. Climber, flowers pink. Not common, Garden Jungle.
- (*D. elliptica* Benth. "Tuba." Often cultivated for killing insects on vegetables, and catching fish).
- D. Malaccensis* Prain. Flowers pink. Jurong, Selitar.
- D. oblonga* Benth. Flowers dark pink. Changi (No. 6086).
- D. sp.* with very velvety leaves. Rare, Chan Chu Kang, Changi (6087).
- Kunstleria Ridlegi* Prain.\* Big climber, flowers small purple almost black. Woods, common but rarely flowering. Garden jungle, Selitar.
- Dalbergia Janghuhnii*. Benth. A woody climber with small

*greenish white flowers.* Woods common, Tanglin, Changi, Pulau Ubin, Sumbawang.

Var. *Scortechinii*. Bukit Timah (6406).

*D. velutina* Benth. Rare, Changi.

*D. pseudosissoides* Miq. Climber, flowers white. Common, Garden jungle, Bukit Mandai, Changi, Selitar, Bajau.

*D. Hullettii* Prain. Flowers white produced when the leaves are fallen. Rare, Thomson Road, Selitar.

*D. torta* Grah. Climber, flowers white. Mangroves and sea shores. Common, Pulau Ubin, Kranji, Pulau Damar.

*Pterocarpus indicus* Willd. The Angsana, or Sena, planted only.

*Zornia diphylla* Pers. Prostrate herb, flowers yellow. Sandy places, Galang, Changi.

*Uraria crinita* Desv. Small shrubby plant with a tall spike of blue flowers, very beautiful; on banks sporadically. Orchard Road, Scott's Road.

*Alysicarpus vaginalis* Miq. A slender herb, flowers black purple. Changi, Teluk Kurau.

Var. *annularifolia* Pulau Ubin (Kunstler).

*Eschynomene indica* L. Shrubby weed, Galang.

*Desmodium triflorum* De C. Prostrate herb in grass, flowers pink. Common, Tanglin, Changi.

*D. heterophyllum* De C. Common over the whole island.

*D. umbellatum* De C. A big shrub, flowers white. Sea coasts all round the island.

*D. polycarpum* De C. A shrubby plant with erect racemes of deep crimson, or rarely white flowers. Common in open country, Tanglin, Changi, Selitar, etc.

Var. *ovalifolia*. Rare, Ang Mo Kio.

*Ormosia macrodysca* Bak. A big tree, flowers pink, pod round and flat reddish pink with a large scarlet and black seed. Rare, one tree in Cluny Road.

*O. parvifolia* Bak. Not a very large tree, leaves small deep green, flowers white, pod round, seed red. Not rare. Blakang Mati, Changi, Pasir Panjang, Reservoir.

*O. microsperma* Bak. Var. *Ridleyi*. Tree about 50 feet tall, flowers white. Rare, Selitar, Tanglin.

*Cassia obtusifolia* L. A common weed with yellow flowers. Waste ground, Tanglin, Galang.

*C. hirsuta* L. A hairy weed with yellow flowers. Common, Tanglin, etc.

*C. occidentalis* L. A common weed.

*C. alata* L. "Gelenggang, Daun Kurasp." Shrub with showy yellow flowers. Common round villages.

*C. siamea* Lam. Tree, yellow flowers. Occurs near Tanglin, but doubtfully wild in Singapore.

*C. Leschenaultiana* De C. A pretty shrublet with yellow flowers. Common round Tanglin, Bukit Mandai.

*Kumpasia malaccensis* Maing. "Kumpas." A gigantic tree with hard red wood. Common all over Singapore.

*Dialium laurinum* Bak. Kranji, Bukit Timah.

*D. Malugayi* Bak. Bukit Timah.

*D. Wallichii* Prain. Common, Garden jungle, etc.

The Dialiums are big trees, which supply the well known timber "Kranji." The fruit, a velvety black pod filled with a sweet pith enclosing a single seed, is eaten by natives and sold in the shops.

*Bauhinia purpurea* L. is quoted in books for Singapore, but is only in cultivation.

*B. semibifida* Roxb. Climber with white flowers. Common, Bukit Timah, Bukit Mandai, etc.

*Cynometra caulisflora* L. "Nam-nam." Cultivated

*C. ramiflora* L. var *heterophylla*. Shrub. Rare, river banks, Sungei Jurong.

*Sindora Wallichiana* Benth. "Saputi." A very fine tree, with green flowers. The calyx is covered with soft processes, not firm prickles as has been described. The flowers are fertilized by flies, which visit them in such quantity that I have heard the roar of their wings from the base of a very lofty tree, when in flower. The pods are flat, usually one seeded and covered with prickles which exude a gum. Garden jungle, Changi, Dalvey Road.

*S. intermedia* Bak. Changi, Blakang Mati.

*Afzelia retusa* Kurz. A small tree, flowers white; sea coasts, common, Bajau, Changi, Pulau Ubin. Selitar, Serangoon.

*Peltophorum ferrugineum* Benth. "Batai." A handsome tree with yellow flowers. Rare, Changi.

*Cesalpinia nuga* Ait. Thorny climber, flowers yellow. Sea shores Changi, Selitar.

*C. tortuosa* Roxb. Rare, Selitar.

*Mezoneuron sumatranum* W. and Arn. A very thorny climber with erect racemes of tubular flame-coloured flowers and thin flat pods bright red. Either in fruit or flower, this is a most beautiful plant. Not very common. Along the Bukit Timah Road. Sungei Jurong.

*Parkia speciosa* Hassk. "Petai." A tree with pear-shaped heads of small yellowish flowers on long hanging peduncles, and flat green pods, eaten by the Malays. Common wild and also planted. Bukit Timah, Bajau, Changi, Selitar, etc.

*Entada spiralis* Ridl. Woody climber with curious curled pods and very large brown subtriangular seeds. Common all over Singapore.

*Adenanthera pavonina* L. "Saga." Commonly planted and perhaps wild.

*A. bicolor* Moon. A more compact tree than "Saga," the seeds half red and half black. Bukit Timah, Bukit Mandai, Bedoh, Pasir Panjang, etc.

*Neptunia oleracea* Lour. The water-sensitive plant, a floating plant with bright yellow flowers. Cultivated as a vegetable and formerly very abundant in Singapore, now rather uncommon.

*Xylosteum dolabriformis* Benth. "Singapore Wallich No. 5279." This has never again been found in the peninsula, and is probably wrongly localised.

*Leucena glauca* Benth. Occurs near villages, doubtless planted.

*Mimosa pudica* L. The sensitive plant, is a well known pest over the whole island.

*M. sepiaria* Benth. An introduced shrub very common along the Bukit Timah Road, Dalvey Road, and near the Reservoir.

*Acacia pseudointria* Miq. A scrambling thorny shrub. Not rare, Bukit Mandai, Changi, Toas, Chan Chu Kang.

*A. pennata* Willd. A thorny climber, climbing very high. Tanglin, hedges and thickets.

*Serianthes grandiflora* Benth. Singapore (Wallich). Not seen.

*Albizia littoralis* Teysm. A tree with pink heads of flowers. Rare, Pulau Ubin.

*A. pedicellata* Bak. Rare, Kranji Road.

*A. lucida* Benth. Singapore *sive* Baker, possibly from a cultivated specimen.

*A. odoratissima* Benth. *A. Lebbek* Benth. *A. moluccana*, some-

times planted, establish themselves in many places.

*Pithecellobium dulce* Benth. Cultivated only.

*P. confertum* Benth. A tree, rare, Bedoh, Selitar.

*P. bubalinum* Benth. Rather rare, Tanglin.

*P. lobatum* Benth. "Jering." Tree with foetid pods, very popular with Malays. Common over the whole island.

*P. microcarpum* Benth. A common little tree with white flowers and bright orange curly pods, very pretty when in fruit. Tanglin, Chan Chu Kang, Bukit Timah, etc.

*P. ellipticum* Hassk. "Jering hutan." A large tree with big curled orange pods from which when ripe hang black seeds covered with a grey bloom. Not rare, Selitar, Pulau Ubin.

*P. contortum* Mart. Common, Tanglin, Changi, Selitar, etc.

*P. clypearia* Benth. Common, Selitar, etc.

*P. angulatum* Benth. Very common in open country, woods, etc. Tanglin, Changi, Chan Chu Kang, etc.

#### ROSACEE.

*Parinarium costatum* Bl. A big tree with white flowers and hard brown drupes with white dots. Rare, Chan Chu Kang.

*P. oblongifolium* Hook. fil. "Balau." A well known timber tree of great size with large leaves white beneath. Rare, Bukit Timah, Bukit Mandai.

*P. Griffithianum* Benth. A big tree with deep green leaves, corymbs of white flowers and yellow plum-like fruits. Local, Fort Canning, Changi.

*P. nitidum* Hook. fil. "Kelat Layu hutan." A medium sized tree with very small red eatable plums. Bukit Mandai Chan Chu Kang.

*Parastemon urophyllum* De C. Sandy places near the sea, Changi, Chan Chu Kang.

*Pygeum Maingayi* Hook. fil. Tree with white flowers clustered on the branches. Not common, Cluny Road.

*P. lanceolatum* Hook. fil. "Singapore Lobb." Doubtless an error for Penang.

*P. polystachyum* Hook. fil. A fair sized tree, flowers whitish, scent of almonds. Common, Tanglin, Bukit Timah.

*P. persimile* Kurz. Rare, Kranji Road.

*Rubus Moluccanus* L. The common wild raspberry, fruit red small and very poor. Thickets over the whole island, very common.

*R. glomeratus* Bl. I doubt this than a variety, it has a longer terminal panicle and more entire leaves, and usually replaces typical *R. Moluccanus* in the hills; I have gathered it however in Jurong.

#### SAXIFRAGACEÆ.

*Polyosma fragrans* Benn. Wallich No. 8472. Not seen.

*P. Ridleyi* King. \* Tree with white flowers. Rare, Selitar.

#### RHIZOPHOREÆ.

*Rhizophora mucronata* Lam. "Belukup." A common mangrove used for firewood. All mangrove swamps. Jurong, Bajau, Changi.

*R. conjugata* L. "Akit." Common, Bajau, Jurong, Selitar.

*Ceriops Candolleana* Arn. "Tengah." Common. Bark used in dyeing either a red brown when used alone, or purple or black in combination with Indigo.

*Bruguiera eriopetala* W. and A. Common, Bajau, Kranji, Jurong.

*B. gymnorhiza* Lam. Common, Jurong, Changi, Sungei Miora.

*B. corynophylloides* Bl. "Bakau Putih." Very common, River Valley Road, Selitar, Serangoon, Jurong, Pulau Ubin.

*B. pareiflora* W. & A. "Lenggadi." Common, Serangoon, Jurong.

*Carallia Scortechinii* King. Tree, rare, Changi.

*Pellacalyx axillaris* Korth. Tree, common in secondary growth. Bukit Timah, Tanglin, Chan Chu Kang.

*P. Saccardianus* Scort. Tree. Common in woods, Bukit Timah.

*Gynotroches axillaris* Miq. "Mata Keli." Tree with whorls of small greenish flowers, and very small red or black berries; very common in secondary jungle and woods, all over the whole island.

*Anisophyllea disticha* Baill. An elegant shrub with pendulous branches and distichous leaves. Common in woods, Tanglin, Changi, Selitar, etc.

*A. Griffithii* Oliver. Rare, Chan Chu Kang.

#### COMBRETACEÆ.

*Terminalia phellocarpa* King. "Mampelam Babi." A tree with small white flowers and large green fruit. Not rare in damp spots in woods, Bukit Mandai, Holland road, Bukit Panjang, Chan Chu Kang.

*T. Catappa* L. "Ketapang." Common along the coasts, and often planted along road sides.

*T. subspathulata* King. A very large tree with winged fruits. Near the Garden jungle, Bukit Timah Road.

*Calycopteris floribunda* Lam. "Singapore Lobb." Doubtless an error for Penang.

*Lamuitzera coccinea* W. & A. Tree with panicles of scarlet flowers. Common near the sea. Bajau, Serangoon, etc.

*L. racemosa* Willd. Flowers white, Jurong.

*Combretum trifoliatum* Vent. I have found fruits of this floating in the sea near Singapore.

*C. rundericum* Miq. Climber, flowers green, Changi, Chan Chu Kang.

*Hiligera appendiculata* Bl. Climber, rare, Bukit Timah.

#### MYRTACEAE.

*Melaleuca leucadendron* L. "Gelam." Wild at Tanah Merah, near Changi. Kampong Gelam may perhaps take its name from trees formerly growing here.

*Tristania Whitiiana* Griff. in Cantor's Plants. Journ. As. Soc. Bengal xxiii: p. 623. *T. Wightiana* Griff. MSS according to Flor. Brit. India, but Griffith named it after a clergyman of the name of White. "Pulawan." A tree 40 feet tall with red bark which flakes off and lies in piles at the foot of the tree: flowers white, fetid. Sandy spots near the sea, Bajau, Pulau Ubin.

*T.* sp. flowers small white, leaves more coriaceous. Woods, Bukit Timah, Bukit Mandai.

*T. Merguensis* Griff. Sungei Mora.

(*T. rufescens* Pierre. A shrub much resembling *Sideroxylon ferrugineum*, apparently this Cochin Chinese plant occurs on cliffs of the island Pulau Battam, South of Singapore.)

*Rhodamnia trinervia* Bl. A medium-sized tree with white flowers, often as white as Hawthorn when in flower; berries red turning black. Very common all over Singapore. The var. *concolor* with leaves green on both surfaces grows in shady places; var. *spectabilis* with the backs of the leaves silvery is common in open country, but the two varieties pass into each other and are often indistinguishable.

*Rhodomgrys tomentosa* Wight. "Kamunting." A bush with rosy or white flowers, fruits plum-colored, eatable. Abundant in sandy spots. Mt. Faber, Blakang Mati, Changi.

*Decuspermum paniculatum* Kurz. A shrub or small tree, flowers white. Common in thickets and woods. Bukit Timah, Bukit Mandai, Jurong, Chan Chu Kang.

*Eugenia*. This genus of trees, probably the largest one known, is a very difficult one, and the identification of many of the species in this list must be somewhat doubtful at present. All in Singapore are trees of no very great size, with white, pink or rarely green flowers. Those with large flowers and fruits are usually known as Jambu, by the Malays, those with smaller flowers, as Kelat.

(*E. (Sect. Jambosa) Malaccensis* L. "Jambu Bol." Flowers large brilliant pink, fruit large white or pink, eatable. Cultivated.)

(*E. aquatica* Burm. "Jambu Ayer Mawar." Flowers white, fruit semitransparent rose or white, eatable. Cultivated).

(*E. Jambos* L. Flowers white. Cultivated).

*E. densiflora* De C. Flowers pink, fruit globular pinkish, not rare, Changi, Siglap, Bukit Mandai, Bukit Timah road.

*E. grandis* Wight. "Jambu Ayer Laut." "Krian." Common on the sea coast and planted along the roads. A big tree flowers white. Wild, at Bajau, Changi.

*E. lepidocarpa* Wight. "Samak Tebrau." Big tree, flowers white; bark used for tanning nets. Common on the sea coast and inland. Tanglin, Bajau, Kranji, Changi.

*E. filiformis* Wall. "Kelat Lapis." Small tree with small white flowers on long pedicels, common in woods. Garden Jungle, Changi, Selitar, Tuijong Gol.

*E. inophylla* Roxb. "Samak Paya." Chan Chu Kang.

*E. pendens* Duthie. Dense woods, Bukit Timah.

*E. Helferi* Duthie. "Singapore Lobb." Not seen; probably from Penang.

*E. (Syzygium) cymosum* Lam. "Kelat Merah." Small tree, flowers

white. Bentley's Hill (Hullett), Changi, Teban, Pulau Tekong.

*E. myrtifolia* Roxb. River banks and near the sea. Sungai Morai, Selitar, Sungai Jurong.

*E. acuminatissima* Kurz. A big tree, flowers white, fruit purple. Garden Jungle, Jurong.

*E. clavigera* Roxb. and *E. leptantha* Wight. "Singapore and Penang, Wallich." Not seen; probably both from Penang.

*E. ceylanica* Wight. "Kelat Nasi-Nasi." Small tree, flowers and fruits white. Dry sandy spots, usually near the sea. Common, Tanglin, Changi, Toas, Kranji.

*E. chlorantha* Duthie. A very handsome tree with bright pink flowers. The name is a very unfortunate one, the petals are greenish white but very inconspicuous beside the brilliant red stamens. Cluny road, Bukit Timah, Tanjong Gol.

*E. lineata* Bl. One of our commonest trees in open country, flowers and fruits copious white. Tanglin, etc. whole island.

*E. pyrifolia* Wall. Cluny road, Changi.

*E. Thunera* Roxb. Garden Jungle.

*E. scaparia* Wall. Singapore (Wallich 2594, not identified).

*E. crenulosa* Wall. Not common, Tampons, Bukit Mandai.

*E. oblongifolia* Duthie. Garden Jungle, Chan Chu Kang.

*E. subdecussata* Wall. "Samak Pulut." Garden jungle, Changi. Toas.

*E. oblata* Roxb. Chan Chu Kang.

*E. papilloea* Duthie. Big tree with red flaky bark. Wet jungles common, Cluny road, Bukit Timah, Bukit Mandai.

*E. bracteolata*. Garden Jungle.

*E. lauricola* Duthie. Pulau Ubin.

*E. anisosepala* Duthie. Shrub near sea shore. Pulau Ubin (Bullett).

*E. microcalyx* Duthie. Bukit Timah.

*E. Griffithii* Duthie. Woods, Changi, Selitar, Garden Jungle, Bukit Timah.

*E. nitida* Duthie. Small tree, flowers pink. Ang Mo Kio, Bukit Mandai, Bukit Timah.

*E. conglomerata* Duthie. Big tree. Garden Jungle.

(*E. Jambolana* Lam. "Jiwat." Planted here and there) And a considerable number of undetermined species.

*Barringtonia speciosa* Forst. Sea coasts, Changi, Pulau Tekong. Beach road.

*B. incisa* (Miers). "Putat." Sea shores, Kranji, Blakang Mati, Galang. This is certainly distinct from *B. racemosa* of the Bot. Mag. t. 3831, to which it is referred in the Flora of British India.

*B. conoidea* Griff. A large shrub, tidal rivers, Selitar.

*B. cylindrostachya* Griff. Shrub with very long racemes of pink on white flowers. Sandy woods. Toas, Changi, Pulau Tekong, Macpherson Road.

*B. pendulum* (Miers). Rare, Bajau.

*Careya* n. sp. A huge tree with large flowers, petals white, stamens white with pink bases. Leaves oblong obtuse coriaceous. Fruit like an apple with grey brown seeds and a strong coarse odour. Rare and seldom flowering. Garden Jungle.

#### MELASTOMACEAE.

*Melastoma polyanthum* Bl. "Senduduk." Singapore Rhododendron. A very common shrub, open country everywhere.

*M. molle* Wall. Singapore Wallich, No. 4046; otherwise only known from the Philippines.

- M. decenifidum* Jack. Singapore, Wallich. (Evidently an error for Penang.)
- Ochthocharis jaranica* Bl. Shrub with pinkish flowers. Common in mangrove swamps. Kranji, Chan Chu Kang, Jurong, Pulau Ubin.
- O. borneensis* Cogn. Rare, tidal rivers, Selitar.
- O. paniculata* Korth. Singapore, Wallich, 4083. (Not seen).
- Sonerila heterophylla* Herb. Dense woods, Chan Chu Kang, Bukit Timah.
- S. moluccana* Roxb. Dense woods, Chan Chu Kang.
- S. obliqua* Korth. Herb, leaves dark green spotted with white when young, flowers rosy. Rocks and dead trees in forests. Common, Bukit Timah.
- Marumia rhabdocarpa* Jack. A climber with large handsome flowers white with a purple eye. Common, Tanglin, Jurong, Bukit Timah, Choa Chu Kang, Selitar.
- Dioscorea punctulata* Hook. fil. Climber. Bukit Timah, Bukit Mandai, Selitar.
- D. pallida* Bl. Climber, flowers rose colored. Not common, Reservoir woods, Bukit Mandai.
- D. annulata* Hook. fil. Woods, Bukit Timah, Bukit Mandai, Selitar.
- D. gracilis* Bl. Slender climber, flowers white. Bukit Mandai, Bukit Timah, Pulau Ubin.
- D. celebica* Bl. Common, Bukit Timah, Reservoir woods, Selitar, Chan Chu Kang.
- D. intermedia* Bl. Rare, Bukit Mandai.
- Asplenium glaucum* Triana. A fine climber with rosy flowers. Woods. Garden jungle, Bukit Timah, Reservoir, Selitar.
- A. annulata* Triana. Rare, Pulau Ubin.

*Medinilla Hasseltii* Bl. Epiphyte with pink flowers and scarlet berries. Common in mangroves and damp woods, Kranji, Bajau, Bukit Mandai, Choa Chu Kang.

*M. macrocarpa* Bl. Rare, Bukit Mandai.

*Medinillopsis sessiliflora* Cogn. Epiphyte, with waxy pink flowers. Mangrove swamps, common, Toas, Selitar, Kranji, Sungei Buloh.

*Pachycentria macrorrhiza* Becc. Epiphyte with swollen stem, flowers pink. Not rare, Selitar, Sungei Morai.

*P. glauca* Triana. Epiphytic, forming large tufts on trees in woods. Common, Bukit Timah road, Bukit Mandai, Kranji, Sungei Buloh, Choa Chu Kang.

These two Pachycentrias are classed by Beccari as ant-plants (*Piante hospitatrici*), but the ants do not live in the swollen stems as suggested by him, the swollen portions being quite solid.

*Pogonanthera reflexa* Bl. Epiphyte, more rarely terrestrial, usually near the sea, Kranji, Changi, Selitar, Toas, Bukit Timah.

(*Clidema hirta* Don. A coarse weed, native of South America, has established itself in Tanglin, near Fort Canning and elsewhere.)

*Pterandra capitellata* Jack. Tree, flowers blue, not common, Toas, Selitar.

*Pt. ceruleans* Jack. Common, Tanglin, Changi, Chan Chu Kang.

*Pt. paniculata* Benth. Rare, Chan Chu Kang.

*Kibessa echinata* Jack. "Sial Munahon." A common tree with pale violet fragrant flowers. Dry woods, whole island.

*K. acuminata* Dene. Collected here by Walker and Maingay; not seen.

*Memecylon*. Trees with small blue or white flowers; a very difficult genus, as the species appear to run into each other.

*M. myrsinoides* Bl. Bukit Mandai.

*M. pauciflorum* Bl. "Singapore, Lobb." Not seen.

*M. verigatum* Bl. "Dulek." Common on the coasts, Kranji, Sungei Buluh, Bukit Mandai, Pulau Tekong.

*M. acuminatum* Bl. Thick woods, Bajan, Bukit Timah.

*M. grande* Retz. A very handsome plant, with panicles of blue flowers. Selitar, Garden jungle, Serapong, Pulau Merawan.

*M. heterolepium* Bl. "Nipis Kulit." Garden Jungle, Changi, Bukit Mandai.

*M. amplexicaule* Roxb. Rare, Chan Chu Kang.

*M.* sp. Garden jungle (4436).

*M.* sp. Bukit Timah (6788).

*M.* sp. Leaves very narrow. Garden jungle (5753).

*M.* sp. Sungei Morai (8840).

#### LYTHRACEÆ.

*Pemphis acidula* Forst. A bush with white flowers. Sea coasts, not common, Changi, Selitar.

*Lagerstroemia Flos-Reginae* Retz. Given for Singapore in King's "Materials," is not wild here.

*Sonneratia*. Large sea-shore trees, often growing in the sea itself.

*S. acida* Linn. Leaves narrow, stamens red. Rare. Balestier plains, by streams.

*S. olba* Smith. "Berombong." Big tree, common, stamens white. Jurong, Changi.

*S. Griffithii* Kurz "Pedada." Toas, Changi, Jurong.

## OSAGRACEÆ.

Herbs or shrubs.

*Jussiaea repens* L. Floating in streams with swollen pithy floats  
Flowers white with a yellow centre. Tanglin.

*J. suffruticosa* L. Shrubby, about 5 feet tall with yellow flowers.  
Common, Serangoon, Kallang, Thomson Road.

*J. angustifolia* Lam. Herbaceous, about 2 feet tall, nearly glab-  
rous. Common in wet spots.

*Ludwigia prostrata* Roxb. A small herb with small yellow  
flowers. Common in wet spots, Tanglin, etc.

## SAMYDACEÆ.

Trees or shrubs with usually very small inconspicuous flowers.

*Casuarina Lobbiana* Turcz. A small shrub, not a tree as in  
King's "Materials," usually about 3 feet tall. Flowers  
minute green, capsule orange with red seeds. Common  
in woods all over Singapore.

*C. equisetina* Roxb. Woods, Sembawang, Selitar.

*C. Clarkei* King. Rare, Chua Chu Kang.

*Osmelia Maiungagi* King. Tree, not rare, Bukit Timah, Kranji,  
Bukit Mandai, Toas.

*Homalium grandiflorum* Benth. Tree, rare, Kranji.

## PASSIFLOREÆ.

*Medecea Singaporeana* Mast. Climber, flowers green, capsule  
red with black seeds in a white aril. Common, Tanglin,  
Bukit Timah, Bukit Mandai, Selitar, Pulau Tekong.

*M. populifolia* Bl. Less common, Bajau.

*Passiflora setosa* has established itself in waste ground near  
Tanglin and elsewhere, as have to a smaller extent *P. suberosa*, *P. minima*, and *P. quadrangularis*.

## CUCURBITACEÆ.

A good many of these are cultivated by the Chinese here, but very few are wild.

*Trichosanthes*. Slender climbing pumpkins with white fimbriate tubular flowers, opening about ten o'clock at night, and egg shaped crimson fruit yellow inside the flat seeds enclosed in a dark green slimy pulp. They are said to be poisonous, but are used by the natives in medicine, the pumpkin being squashed on the head to cure headache.

*T. Wattlichiana* Wight. Very common in woods and hedges, all over Singapore.

*T. Watersei* Cogn. Not rare, Tanglin.

*T. celebica* Cogn. Leaves deep green rather stiff and shining trifoliate. The fruit much larger and cylindrical oblong. Tanglin, Choa Chu Kang.

Commonly cultivated and sometimes occurring in waste ground are *Lagenaria vulgaris* Ser. Bottlegourd; *Luffa egypciaca* Mill. "Petola;" *Momordica charantia* L.; *Cucumis sativa* "Timon," cucumber; *Citrullus vulgaris* Schrad. Water melon; *Cucurbita moschata* Duch. *C. pepo* De C. "Labu," and *Benincasa cerifera* Savi. "Kundur."

## FICOIDÆ.

*Sesuvium portulacastrum* L. Herb, flowers pink. Tidal mud, Changi, Tamponis road.

*Mollugo stricta* L. "Tapak Burong." A small weed with white flowers. Common, Tanglin, Changi.

## UMBELLIFERÆ.

This order, as elsewhere in the tropics, is very scantily represented. I have doubts as to any of the species being native.

*Hydrocotyle asiatica* L. "Pegaga." A very variable creeping herb, much in request as a salad and as medicine, it is regularly collected and sold in the herb shops. Very common over the whole island in grassy spots.

*H. rotundifolia* Roxb. A very small-leaved species. Occurs in flower beds in the botanic gardens as a weed.

*Eryngium foetidum* Jacq. A prickly herb with a nauseous odour. Eaten by Chinese. About villages, Changi, Choa Chu Kang, etc. A native of the West Indies.

#### ARALIACEAE.

*Aralidium pinnatifolium* Miq. "Tinggal Bahai." A shrub or small tree with lobed or entire leaves, panicles of small green flowers and large drupes, at first white, when ripe black with an unpleasant soapy taste. Common, Bukit Timah, Jurong, Kranji.

*Heptapleurum acene* Seem. Epiphyte usually in mangrove swamps, the lower leaves are trifoliate, the upper ones simple. Not common, Kranji, Selitar, Pulau Ubin.

*H. cephalotes* Clarke. A tree. On rocks, Bajau, Kranji, Pulau Ubin.

*H. subulatum* Seem. Epiphyte on trees in woods, not common, Chua Chu Kang.

*H. ellipticum* Seem. Epiphyte. Bukit Timah, Kranji.

*H. Ridleyi* King\*. An epiphyte, or a shrub on rocks near the sea. Flowers yellow. Not rare, Kranji, Sungai Morai.

*H. Hullettii* King. A beautiful plant, with handsome foliage, digitate and deep green. Flowers pure white in long axillary panicles, fruit small purple. A tree, often epiphytic at first. Woods, Chan Chu Kang and Chua Chu Kang.

*Arthrophyllum diversifolium* Bl. "Jolok Hantu." A tree about 20 feet tall with green flowers and black fruit, very common all over Singapore in open country.

#### CORNACEAE.

*Marlea nobilis* C. B. Clarke. "Sutabal." Big tree. Rare, Bukit Timah.

*M. ebenacea* C. B. Clarke. "Lidah Kerbau" (Buffalo tongue.)

A very fine and large tree with white flowers. A good timber; the fruit is large and deep purple. Garden jungle.

*M. Griffithii* C. B. Clarke. Rare, Sungei Buluh.

*M. sp.* "Kayu Tas." Rare, Ponggol.

This tree is supposed to have remarkable powers in driving away tigers, and the Malays often wear bits of its wood to protect them from these animals.

*Mastixia Junghuhniana* C. B. Clarke. Garden jungle.

#### CAPRIFOLIACEÆ.

*Viburnum sumbicum* Reinw. A large bush with white flowers and red drupes. Rare, Road to Kranji near Bukit Mandai.

#### RUBIACEÆ.

*Sarcocapnos Junghulnii* Miq. "Uhermin Ayer." A medium sized tree with balls of small yellowish white flowers and hard brown compact heads of fruits. The timber is of fair quality and used for posts. Woods, Tanglin, Siglap, Changi, Selitar.

*S. subditus* Miq. Rarer, Kranji.

*S. Maingayi* Hav. Bukit Timah Road.

*S. sp.* A big tree. Chan Chu Kang (6831).

*Adina rubescens* Hemst. "Berambong." A tall tree with good yellow timber, remarkable for the curious natural holes or depressions in the trunk. Common Tanglin, Bukit Timah.

*Uncaria*. "Akar Kait-Kait." There are a number of kinds of wild gambiers, all are climbers, and often climb very high by the aid of short hook-shaped branches, whence the native name (Kait, a hook). Some attain a great size, as thick as a man's leg, and these can be safely depended on

as water-vines, supplying an excellent clear water, to obtain which it is only necessary to cut the stem through at one blow of a parang, as high as can be reached and then cut through it again about three feet below, when the water will drip rapidly from the cut portion. A piece 3 feet long cut like this will give about half a pint of water. The flowers are produced in balls two inches or more through, and are usually green and reddish. The fruits are capsules, with very fine winged seeds.

- U. pedicellata* Roxb. "Akar Sulumbah." One of the biggest species, with very large flowers covered with white silky hairs. Common on edges of woods, etc. Tanglin, Bukit Timah, Toas, Chan Chu Kang.
- U. pteropoda* Miq. "Akar Kait-Kait Darat." A very large plant, with broad leaves, stem 4 or 5 inches through. Common in woods, Garden jungle, Bukit Timah, Selitar.
- U. attenuata* Korth. "Akar Kait-Kait Merah." A smaller plant, the leaves covered with red wool on the back. Not common, Bukit Mandai, Bukit Timah Road.
- U. orata* Hook. fil. Rare, Tanglin near the Gardens.
- (*U. gambir* Roxb. The gambier plant is cultivated and often persists long after cultivation has been abandoned. It is probably not a native.)
- U. jasminiflora* Wall. Flowers greenish white. Not common, Dalvey Road, Jurong, Selitar.
- U. glabrata* De C. Not very common. Bukit Timah, Bukit Mandai, Pulau Ubin.
- U. ferrea* De C. Chan Chu Kang, Chua Chu Kang.
- U. Roxburghiana* Korth. Chua Chu Kang, Bukit Mandai.
- U. dasycneura* Korth. was said to have been collected here by Lobb. Probably an error for Penang.
- Coptosapelta flavescens* Korth. A climber with sweet greenish white flowers. Rare, Chua Chu Kang.

*Dentella repens* Forst. "Bunga Karang." A little creeping weed with white flowers. Common in waste ground, Tanglin, Galang, etc.

*Argostemma porrifolium* Benn. *A. elatostemma* Hook, and *A. spinulosum* C. B. C., collected by Lobb and labelled Singapore, were doubtless mislabelled. The *Argostemmas* are all hill plants.

*Hedysaris capitellata* Wall. A climbing plant with greenish heads of flowers. Common in thickets, Bukit Timah, Chan Chu Kang, Bukit Mandai, Chua Chu Kang.

*H. vestita* Br. "Tokong Bulu." A rough branching herb with whorls of lilac flowers. Waste ground, Bukit Panjang, Changi.

*H. auriculata* L. Somewhat resembling the last, but less hairy, and with white flowers. Common, Tanglin, Chan Chu Kang, Toas.

*H. pinifolia* Wall. A common weed in sandy spots with narrow linear leaves and white flowers. Changi, Teluk Kurau, var. *coespitosa*. A much more tufted form, grows in the same places.

*H. congesta* Br. "Rumput Lidah Jim." A stiff erect coarse herb with white flowers, common in woods, Tanglin, Bukit Timah, Jurong, Blakang Mati.

*Oldenlandia corymbosa* L. A common little annual weed in waste ground with white flowers. Very variable, the variety *asmifolia* is as common as any form. Tanglin, Changi, etc.

*O. diffusa* L. Common in sandy spots. Tanglin, Changi, Jurong.

*O. Heynei* Br. Tanglin in grass plots.

*O. triueria* Retz Sandy places, Galang, Tanglin.

*O. dichotoma* Retz? Flowers violet. Teluk Kurau.

*Ophiorrhiza Harrisiana* Heyne, var. A small herb with white flowers. It differs from the type in being very much more pubescent, and having pubescent capsules, and is perhaps a distinct species. Damp rocks in jungles. Common, Chan Chu Kang, Bukit Timah, Bukit Mandai, Chua Chu Kang, Pulau Ubin, Jurong.

*Mussaenda glabra* Vahl. "Balik Adap." A common and conspicuous shrub with orange or yellow flowers, and one lobe of the calyx developed into a large white leaf-like limb. Very variable. In the typical form the leaves are narrow lanceolate and glabrous in another they are ovate and pubescent. In the var. *setulosa* broad and rounded with bristles on the midrib above and pubescent beneath. Common all over Singapore.

*M. variabilis* Hemsl. A half scandent shrub with large star-like flowers, at first scarlet, then orange. Common in the peninsula, rare in Singapore. Selitar.

*Lucinea morinda* De C. Local in deep wet jungle. Bukit Mandai, Chan Chu Kang.

*Adenosacme longifolia* Wall. A slender shrub about 3 feet tall with small flowers, and translucent white berries. Damp rocky ravines. Bukit Timah.

*Urophyllum*. Slender shrubs, rarely small trees, with very small white flowers in axillary clusters and yellow or orange berries.

*U. Griffithianum* Wt. Common in woods, Changi, Bukit Timah, Bukit Mandai, Sungai Buluh.

*U. glabrum* Bl. Very common, Bukit Timah, Chan Chu Kang, Garden jungle,

*U. streptopodium* Wall. Common, Garden jungle, Bukit Mandai, Pulau Ubin.

*U. hirsutum* Wt. Common, Kranji, Toas, Selitar.

*U. villosum* Wall. "Singapore Lobb," probably an error for Penang.

- Lecananthus erubescens* Jack. "Achar Achar." A scrambling epiphyte in swampy jungle. Flowers small white with purple bracts in heads. Chua Chu Kang, Jurong, Selitar.
- Webera fragrans* Bl. "Jarum Jarum." Shrub with greenish white sweet flowers. Kranji, Bukit Timah, Tanglin, Bukit Panjang.
- W. mollis* Wall. Small tree, Garden jungle, Bukit Mandai, Selitar.
- W. grandifolia* Hook. f. A shrub with greenish white flowers. Changi, Bukit Mandai, North Selitar, Bukit Timah.
- W. sp.* Shrub with white flowers. Tampenis (5961), Sungei Brih.
- W. sp.* Chan Cho Kang (6147).
- Gardeniopsis longifolia* Miq. This curious shrub grows in woods. The flowers are seldom produced, they are fairly large and white tinted with rose. Miquel's description of the plant, as obtained by him in Sumatra, fits the peninsular species very well. Bukit Timah.
- Randia fasciculata* De C. A thorny shrub, common near the sea, Changi, Pasir Panjang, Balestier plain, Teluk Kurau.
- R. longiflora* Lam. A strong spiny climber with large white flowers. Not common. Garden jungle, Bukit Timah.
- R. angulosa*, *Canthium angulosum* Wall. A strong spiny climber like the last, but with much smaller flowers in dense heads. It is indeed referred to that species as a variety in the Flora of British India, but seems to me utterly different. Rare, Garden jungle.
- R. densiflora* Benth. "Merumbong jantan." A fairly big tree with a good timber, flowers small white, berries orange. Common on some spots, Changi, Selitar.
- R. anisophylla* Jack. "Simpoh." A medium sized tree with small white flowers, and oblong green fruits, woody, containing many flat seeds in a sweet black pulp, eaten by monkeys, but said to be poisonous by the Malays. Common in woods, and secondary jungle all over Singapore.

*R. macrophylla* Br. "Delima hutan." A small shrub with large white trumpet-shaped flowers 4 inches across, white with dark purple spots in the mouth. A most beautiful plant. Common, Garden jungle, Changi, Bukit Timah, etc.

*Gardenia tubifera* Wall. A shrub or large tree with large sweet-scented flowers opening nearly white and becoming orange very quickly. Dense woods and river banks, not very common here. Garden jungle, Changi, the Reservoir.

*G. Griffithii* Hook. fil. A slender straight tree, with much larger flowers than the last and very large globose fruit. Local, damp thick woods. Bukit Timah, Selitar, Sungai Buluh, Bukit Mandai.

*G. speciosa* Hook.\* "Singapore, Lobb," I have not seen. This fine gardenia has only been collected by Lobb and never met with again.

*Petunia venulosa* Hook var. (?) Small tree, possibly a distinct species. Garden jungle.

*Scyphiphora hydrophyllacea* Gaertn. "Chingum." A very common sea shore shrub, with small white flowers. The seeds may often be seen thrown up on the sea shore in great quantities. Along the coast with mangroves.

*Jussiaea ornata* Wall. A tall slender tree about 20 feet tall, with drooping panicles of rosy white flowers, and red fruits, very beautiful. Common in open swamps and wet borders of woods. Dalvey road, Bukit Timah, Changi, Selitar.

*Guettarda speciosa* L. A common small or medium sea-coast tree, flowers white, Changi, Selitar.

*Timonius Jambosella* Thw. A very common tree 12 to 20 feet tall, with small yellow flowers. Secondary jungle everywhere.

*T. Rumphii* De C. "Tulang-Tulaang Paya." Common in secondary jungle, whole island.

*T. Finlaysonianus* Wall. A sea-shore plant, flowers white. Tidal rivers, Serangoon, Changi.

*Castadium didymum* Roxb. "Mata Keli jantan." Tidal rivers and other places near the sea. Common, Kranji, Selitar, Pulau Tekong.

*C. glabrum* Bl. A tall tree, 20 feet high, with small greenish white flowers and large grey-green plum-shaped fruits containing two 3-sided stones. Woods, Garden road, Toas.

*C. confertum* Korth. Garden jungle (4124), Selitar, Pulau Tekong.

*C.* sp. "Gading." The white wood, suggesting ivory, gives it its native name, the leaves are used for making a kind of tea. Not rare, Tanglin, Thomson Road, Selitar, Jurong (6506).

*C. horridum* Korth. "Bulangan Tikus." A small thorny shrub, with small green flowers and plum-like yellow fruits. Common especially near the coast in dry spots. Tyersall, Tanjong Katong, Bukit Timah, Changi, etc.

*C. scandens* Bl. "Akar Kuku Baning," lit. tortoise-claws. A thorny climber with pubescent leaves, green flowers and black fruits. Thick Woods, Garden jungle.

*Ipomoea pendula* Jack. A pretty shrub about 4 feet tall with clusters of slender flowers white with a pink tube on long hanging peduncles. Fruit small elliptic dark purple. Common in thick woods. Garden jungle, Changi, Chan Chu Kang, Bukit Timah.

*I. opaca* Br. Woods. Changi, Bukit Timah.

*I. fulgens* Roxb. "Bunga Pechah Priok," lit. the broken pot, the red spreading corolla lobes supposed to resemble a broken earthenware pot. One of the showiest native plants, the splendid orange red trusses of flowers being most conspicuous. Common in woods, Tanglin, Bukit Timah, Changi, Pulau Tekong, etc.

*I. congesta* Roxb. A similar plant with broader leaves and shorter flowers. Common, Changi, Chan Chu Kang, Pulau Utan, Garden jungle.

- I. concinna* Br. A shrub or small tree, flowers red or yellow. Rather rare, Chan Chu Kang, Chua Chu Kang.
- I. parviflora* Vahl. A tree with small yellow flowers. Rare, Chan Chu Kang.
- I. amena* Wall. Shrub with orange red flowers not common, Serembun, Chua Chu Kang.
- Pavetta indica* L. "Jarum-Jarum." A large bush with greenish white flowers, Kranji, Bukit Timah, Chan Chu Kang.
- Morinda citrifolia* L. "Mengkudu." A small rarely large tree with white flowers, and large pulpy semitransparent heads of fruits. The bark of the root is used for dyeing and tanning nets, also in native medicine. The fruit is used as soap and eaten. It is very doubtfully wild, though it is very common in waste ground.
- M. tinctoria* Roxb. "Mengkudu Hutan." A smaller shrubby plant with narrower leaves possibly the wild form of the preceding. Common everywhere in secondary jungle.
- M. persicifolia* Ham. Singapore (Maingay); not seen.
- M. umbellata* L. Climbing or erect shrub, heads of fruit small orange. Very abundant in open country near the sea. Changi, Pulau Ubin.
- M. sp.* A tall climber with slender stems pubescent leaves and small orange heads of fruits. Garden jungle.
- M. sp.* "Sulong Akar Darat." A scandent shrub with thick leaves pubescent at the back, flowers few in a head white with a long tube and pubescent mouth, very fragrant. Borders of woods, Changi, Pulau Ubin, Pulau Tekong.
- Prismatocarpus albidiiflora* Thw. A pretty shrub with white flowers. Open places near the coasts, also in swampy woods. Changi, Bajau, Selitar, near the Bungalow.
- Gynochthodes sublineolata* Miq. A climber with white flowers

and curious lead-grey fruits. Common near the sea, rarer inland, Changi, Tanglin.

*G. cuneata* Miq. A much larger broader leaved plant. Not common, Changi, Garden jungle.

*Psychotria*. A large group of shrubs or climbers with white or green flowers, and black orange or white berries.

Shrubs. Berries orange or black.

*P. stipulacea* Wall. Not common, Bukit Timah.

*P. angulata* Korth. Changi, Garden jungle.

*P. Helferiiana* Kurz. Common, Garden jungle, Jurong, Selitar, Kranji, etc.

*P. Maloyana* Jack. Fruit black. Bukit Timah (6168), Bukit Mandai, Pulau Ubin.

*P. Griffithii* Hook. fil. Bukit Timah, Pulau Ubin.

*P. montana* var. *tabacifolia* Wall. Singapore, Wallich 8334. (Not seen.)

Climbers, berries white or green.

*P. polycarpa* Miq. "Akar Chinta Mula." Common in hedges, Garden jungle, Changi, Kranji, etc.

*P. sormentosa* Bl. Common, woods, Serangoon, Changi, Bukit Mandai, Selitar.

*P. Maingayi* Hook. fil. Woods, Selitar, Bajau.

*P. morindiflora* Wall. Rather common, Sungei Buluh, Bukit Mandai, Chan Chu Kang.

*P. oboidea* Wall. Common, woods, Garden jungle, Jurong, Bukit Timah.

*P.* sp. with grey green fruits and large leaves. Reservoir woods.

*P.* sp. leaves lanceolate, flowers green, Kranji, Ang Mo Kio.

*Chasolia curviflora* Thw. "Pechah Piring putih." A very common and variable small shrub or herb, flowers white

on purple stalks, berries black on thickened white stalks.  
Woods, everywhere, Garden jungle, Bukit Timah, etc.

*C. rostrata* Miq. Garden jungle, Bukit Timah.

*Geophila lirata* Miq. Creeping plant with white flowers, local.  
Reservoir woods, Bukit Timah.

*Cephaelis Griffithii* Hook. A small shrub with yellow honey-scented flowers in an involucrate head; berries light blue.  
Sandy woods, Toas, Bajau; also Garden jungle.

*Lasianthus*, small shrubs with axillary whorls of white flowers  
and blue or white berries.

*L. cymocarpus* Jack. Sea coasts, Pasir Panjang, Changi,  
Palau Ubin, Palau Tekong.

*L. appressus* Hook. fil. Garden jungle, Bukit Timah, Chan  
Chu Kang.

*L. pterospermus* Wt. Rate, Chan Chu Kang (6711).

*L. densifolius* Miq. Common, Garden jungle, Changi, Bukit  
Timah, Sehtar.

*L. Griffithii* Wt. Common, Bukit Timah, Chan Chu Kang,  
Sungei Blukang.

*L. stipularis* Bl. Bukit Timah (4903).

*L. ellipticus* Wt. Garden jungle, Bukit Timah, Chan Chu Kang.

*L. crinitus* Hook. fil. Garden jungle, Bukit Mandai, Pasir  
Panjang.

*L. Maingayi* Hook. fil. Singapore (Hullett 628.) and several  
other unidentified species.

*Saprosma* sp. Rare, Bukit Mandai.

*Hydnophytum formicarium* Jack. The ant plant, "Kapala Beruk."  
one of our most curious plants, epiphytic with a large  
swollen tuberous stem containing passages always full of

ants, flowers small white, fruits orange juicy. Common Tanglin, Selitar, Sungei Morai, etc.

*Myrmecodia echinata* Jack. Much resembles the last, but is covered with spines. Rarer, Bukit Timah, Jurong.

*Poederia foetida* L. "Akar Sekuntut." A slender climber with panicles of violet and white flowers. The whole plant has an unpleasant odor. Not common, Chan Chu Kang, Bukit Timah.

*P. tomentosa* Bl. Singapore (Fl. Brit. Ind.) ; not seen.

*Spermacoce hispida* L. A common weed with pink flowers. Paths and waste ground, Tanglin, Changi, Selitar, etc.

*S. scaberrima* Bl. A rough scrambling herb, flowers white. Waste ground, Chasserai estate.

*S. ocyoides* Burm. A prostrate herb, flowers white. Roadsides, Choa Chu Kang, Passir Panjang, Gardens.

#### COMPOSITE.

This large order is represented here by four or five native plants and a number of weeds introduced, but now established in waste ground and such places.

*Vernonia arborea* Ham. "Merambong." A large tree with lavender colored flowers. There are two forms of it, one a tall straight tree 50 feet high with perfectly glabrous leaves, Cluny Road, etc., and one more stunted and gnarled with pubescent leaves, Changi, Chan Chu Kang, Jurong, Chua Chu Kang.

*V. ciliarea* Less. A common little weed with purple flowers, grows everywhere.

*V. chinensis* L. "Ruku Gajah." A larger rough herb, flowers purple. Common in villages, Chan Chu Kang, Tanglin, Bukit Mandai.

*V. scandens* De C. "Tombak-Tombak." A climber in thickets, flowers yellow. Tanglin, Bukit Timah, Selitar, Changi.

*Elephantopus scaber* L. "Tutup bumi." A very common weed flowers pink. Whole island.

*Adenostemma viscosum* Forst. A coarse herb with white flowers, waste ground near houses, Chan Chu Kang, Pulau Ubin, Bukit Panjang.

*Ageratum conyzoides* L. An exceedingly common weed with blue or white flowers, everywhere.

*Mikania scandens* Willd. "Akar Churoma." A climber with hanging heads of flowers. Thickets, not common, Jurong, Woodsville.

*Erigeron linifolius* Willd. "Sumbong Jantan." A large coarse weed. Waste ground, Tanglin, Selitar, etc.

*Blumea lacera* De C. An erect herb with yellow flowers. Common waste ground and grassy places. Tanglin, Selitar, etc.

*BL membranacea* De C. Alexandra Road.

*BL balsamifera* De C. Ngai Camphor. "Sumbong." A tall herb about 8 feet high or less, with yellow flowers. The whole plant has a strong camphor smell, and is used in medicine by the natives. Very common in open ground, Tanglin, Bedoh, etc.

*Pluchea indica* Less. "Poko Beluntas." A sea-shore shrub with lilac flowers. Very common on the sea coast, Changi, Galang, etc.; rarer inland, Tanglin, near the rifle range,

*Sphaeroanthus africanus* L. A herb with heads of white flowers. Ditches, Galang.

*Cesalpinia axillaris* Roxb. Ditches, Tanglin and Galang.

*Ectipta alba* Hassk. Common weed in waste ground, flowers white.

*Centipeda orbicularis* Lour. A very small prostrate weed with minute purple flowers. Paths in the Botanic gardens.

*Wedelia biflora* De C. "Serenai Laut." Sea-shore herb with yellow flowers. Common, Galang, Kranji, Changi.

*Spilanthes acmella* L. "K'rabo." The toothache plant, a common weed with conical heads of yellow flowers very pungent. Sold in the native herb shops. Open country, Sungai Morai, Ang Mo Kio.

*Synedrella nodiflora* Gaertn. Stiff weed with yellow flowers. Very common everywhere.

*Tridax procumbens* L. Sandy places, Tanjong Katong, Cathedral Close, Changi, Teluk Kurau..

*Artemisia vulgaris* L. Often cultivated for medicine in Chinese villages.

*Gynura sarmentosa* De C. "Akar Subiak." Climbing herb with glaucous green leaves, and yellow flowers in a purple involucre. Swampy spots in dense jungle, Bukit Mandai, Bukit Timah, Tanglin.

*G. pseudochina* De C. A coarse common weed, Tanglin, Tanjong Katong, Selitar, etc.

*Emilia sonchifolia* De C. "Katumbi jantan." Common herb with bright pink flowers, waste ground.

(*Cosmos bipinnatus*. Often cultivated as a vegetable.)

*Acanthospermum xanthocephalum* De C. Prostrate herb with white flowers and burr-like fruit. Not common, Pasir, Panjang, Ang Mo Kio, Tanglin.

#### GOODENOVIEÆ.

*Scorola Koenigii* Vahl. "Ambong-ambong." A common sea-shore shrub. Flowers and fruit white. All round the coasts. Changi, Selitar, Pulau Ubin, Blakang Mati.

#### CAMPANULACEÆ.

*Pratia begonifolia* Lindl. Small creeping herb with blue and white flowers. Wet spots by streams, Bukit Timah, Choa Chu Kang.

*Pentaphragma begoniaefolium* Wall. "Balong Ayam Batu." (Rock Cock's comb), a very curious herb with scorpioid spikes of creamy yellow flowers with purple spots inside. Banks in woods, common, Bukit Timah, Sungei Morai, Changi, Chua Chu Kang.

## VACCINIACEÆ.

*Vaccinium malaccense* Wt. "Kalumpadang." A large bush with pink or white fragrant flowers and eatable black fruits. Sandy places at Changi, abundant.

*V. bancanum* Miq. Epiphytic or terrestrial. A bush or small tree, leaves often red stiff, flowers waxy pink red or white. Sea coast, Toas, Changi, Sungei Morai, on high trees, Bukit Timah.

*V. acuminatissimum* Miq. Rare, Bukit Mandai.

## ERICACEÆ.

*Rhododendron lampoungum* Miq.: *R. javanicum* var. *tubiflorum*, Bot. Mag. t 9840. A beautiful epiphytic shrub on the tops of lofty trees. Bukit Timah, very rare. Flowers bright red.

## EPACRIDÆ.

*Leucopogon malaganus* Jack. Shrub with small white flowers and red fruit. Sea shore, Changi.

## PLUMBAGINÆ.

*Plumbago zeylanica* L. "Cheraka." Waste ground near villages, Galang, etc.

## MYRSINÆ.

*Mesa indica* L. A large shrub or small tree with very small white flowers. Common in woods, Bukit Timah, Reservoir woods, etc.

*M. ramentacea* De C. A half climbing shrub with narrower leaves, but otherwise much like the last. The branches

often bear moss-like masses of abortive branchlets, which are much more elegant than the very insignificant flowers. One of the commonest shrubs in jungles and secondary forest, everywhere.

*Myrsinæ capitellata* Wall. A small tree, with small white flowers and fruits. Sea coasts, not common, Changi, Bajau.

*Embelia Ribes* Burm. Very common in woods and thickets, Tanglin, Bukit Timah, etc.

Var. *garciniifolia*. A distinct looking plant with much more coriaceous leaves. Rarer, Changi, Reservoir woods, Bukit Timah.

*E. coriacea* A. De C. Thick jungles, Selitar, Bukit Mandai.

*E. Lissamnis* Scheff. Hedges, not common, Changi, Bukit Timah.

*E. amethystea* Clarke. Hedges, Bukit Timah Road, Bukit Mandai.

*E. lucida* Wall.\* Cat 2315. Singapore. I have not met with it.

*Lalisia pothoina* Lindl. "Akar Fatimah." A little shrub with small pink flowers, and scarlet fruit, leaves of young plants crenulate deep green edged with pink, when older lanceolate with long petioles (var. *lanceolata*) or the petiole winged the whole length, (*pothoina* proper). Common in dense woods.

*Ardisia*. Shrubs, rarely small trees, with or rose pink flowers, often showy, and red or black berries.

*A. crassa* Clarke. Rare, Chan Chu Kang (3844).

*A. lanceolata* Roxb. Very handsome shrub. Selitar, Bukit Timah.

*A. colorata* Roxb. Flowers very small, pale pink. Common, Bukit Timah, Garden jungle, Changi Road.

*A. tuberculata* Wall. Common, Bukit Timah, Selitar, Sungai Morai.

- A. crenata* Roxb. "Mata Pelandok." Common, Alexander Road, Changi, etc.
- A. villosa* Roxb. Rare, dense woods, Pulau Ubin.
- A. odontophylla var. *Lobbii**. Singapore, Lobb; probably an error of locality.
- A.* sp. near *Bhotonica* Clarke. Rare, Ang Mo Kio (6434).
- A.* sp. near *villosa*. Rare, Pulau Ubin (2816), Changi.
- A. humilis* Vahl. One of the largest species, flowers rose pink, berries black. Tidal mud, and damp spots. Common, Galang, Holland Road, Tanjong Katong, Changi, etc.
- Pimelandra Wollichii* De C. A small tree, flowers pinkish white, berries white with black spots. Common, Tanglin, Changi, Sembawang.
- Aegiceras majus* Gaertn. Mangroves local, Toas, Sungai Morsai, Pulau Ubin.

## SAPOTACEAE.

A group of trees, of which many produce gutta percha or Caoutchouc. There are a considerable number here, but they are difficult to collect on account of their great size, and are not easy to identify.

*Chrysophyllum Roxburyi* G. Don. A tall tree with small dark green leaves and yellow flowers, fruit globose 5-angled yellow  $\frac{1}{2}$  an inch long, sweet and eatable but full of rubber. Not rare, Tanglin, Bukit Timah.

*Sideroxylon ferrugineum* Hook. Small tree or shrub. Common along the coast, Serangoon, Kranji, Changi, Pulau Damar.

*S. Muangayi* Clarke. Big tree. Garden jungle.

*S. Malaccense* Clarke. Very large tree. Tanglin, Garden jungle, Selitar.

*Dichopsis baucana* Miq. Vast tree, flowers and fruit green. Garden jungle.

*D. oborata* Clarke. A big tree producing a gutta inferior only to that of *D. Gutta*. Tanglin, Changi.

*D. Gutta* Benth. A large tree, easily known by the beautiful golden underside of the leaves. Though it was formerly very abundant in Singapore, nearly all the larger trees have been cut for the gutta percha. Flowers small white, very rarely produced. *D. oblongifolia* is I think specifically undistinguishable, merely a variety. It is the commonest form now in Singapore. Dense jungle, widely scattered over Singapore. Garden jungle, Bukit Timah, Selitar, Pulau Damar.

*D. rubens* Clarke. Rare, Changi, Chan Chu Kang.

*Bassia Mottleyana* De Vr. A big tree, Selitar, Jurong, Kranji, Bukit Mandai.

*B. cuneata* Bl. Rare, Bukit Timah.

*B. Kingii* Stapf. Bukit Timah.

*B. Malaccensis* (*Payena Malaccensis* Clarke). Common, Garden jungle, Changi, Bukit Timah, Selitar.

*Payena costata* King. "Niato." Common, a medium sized tree. Garden jungle, Selitar, Reservoir woods.

*P. Maingayi* Clarke. "Getah Percha Burong." Rare, Sungai Morai (6497).

*P. Leerii* Benth. "Getah Sundik." Bukit Timah, Bajau.

*Mimusops hexandra* Roxb. "Niato hitam." Rare, Tanjong Gol.

(*M. Etengi* L. "Poko Tanjong." Commonly planted, but doubtfully wild.)

#### EBENACEÆ.

*Maha lucifolia* Pers. Small tree. Rare, Tampinis.

*Diospyros microphylla* Bedd. Large tree, produces ebony; Garden Road, Bukit Timah.

- D. lucida* Wall. "Kayu Arang." Woods, usually near the sea, not rare. Bukit Timah, Bukit Mandai, Changi, Loyang, Bajau, Tampenis, Sungei Morai.
- D. bilocularis* Oliv. *Maba Maingayi* Hiern. Tree. Garden jungle.
- D. sapotooides* Kurz. Very large tree, Bukit Timah, Chan Chu Kang.
- D. oblonga* Wall. Garden jungle, Bukit Timah, Tanjong Gol.
- D. elaeigera* Clarke. Produces ebony. Sungei Morai.
- D. argentea* Griff. "Bedil Lalat." "Mulatope Lalat." A small tree with large leaves coated beneath with golden yellow fur. Fruit large, covered with red hair. The dried leaves when burnt crackle, and this is supposed to drive away mosquitoes, hence the native name "Fly-cracker." Not rare. Dense jungle, Bukit Timah, Changi, Chan Chu Kang.
- D. sp.* with large coriaceous leaves, and cream colored flowers on the stem, fruit pearshaped. Bukit Timah.

## STYRACEAE.

*Symplocos*, small or medium trees with white flowers and blue or green fruit.

*S. spicata* Roxb. Rare, Bukit Mandai.

*S. fuscicollata* Zoll. Flowers white in small nearly sessile cymes drupes blue. Very common, woods and secondary jungle. Tanglin, Bukit Timah, Selitar, etc.

*S. adenophylla* Wall. Common in woods, especially near the sea. Changi, Jurong, Kranji, Toas, Pulau Tekong.

*S. celastrifolia* Griff. Rare, Jurong River (8423).

*S. rubiginosa* Wall. Not very common, Chan Chu Kang, Bukit Timah.

*S. rigidula* Clarke. A big tree. Rare, Changi.

*S.* sp. "Donoon." A medium sized tree, flowers in compact cymes. Rare, Kranji.

*Styrax Benzoin* Dryand. Gum benjamin. "Kemenian." A tall tree with sweet white flowers, and hard grey round flattened fruits. Produces the gum benjamin of commerce, which is obtained by cutting gashes in the bark, when the gum, after some weeks, exudes. Common in jungle, Garden jungle, Bukit Timah, Selitar, Choa Chu Kang.

*S. crotonoides* Clarke. Singapore (Wallich No. 7848); also in Cantley's collection. I have never seen it here.

#### OLEACEÆ.

*Jasminum bifarium* Wall. "Melor hutan." Wild Jasmine, very common in open country, and hedges, Tanglin, Balestier plain, Changi, etc.

*J. Griffithii* Clarke. "Kuma-Kuma hutan." A very hairy jasmine. Rare, woods, Garden jungle, Bidadari, Chan Chu Kang.

*Olea maritima* Wall. A large bush with small green flowers and black drupes. Sea coasts in dry spots, Tanjong Katong, Changi, Pulau Ubin.

*Linociera pauciflora* var. *palemboonica*. A big tree with small white flowers. Common, Bukit Mandai, Bukit Timah, Changi.

#### APOCYNACEÆ.

*Wilkiea firma* Bl. "Getah Grip or Gegrip." A large woody climber with rough black bark, white flowers and green or orange oblong or globose fruits. Seeds deep violet inside. It abounds in rubber, and is the best of all the local rubber vines. The fruit is eatable and sweet, but full of rubber milk. Common, Garden jungle, Bukit Timah, Changi, etc.

*W. coriacea* Wall. "Getah Ujol." An inferior Gutta, which does not set readily, it is used for adulterating and for

bird lime. Common, Tanglin, Bajau, Changi, Blakang Mati, Bukit Timah.

*W. flavescentes* Dyer. Flowers short yellowish white, fruit globose orange, containing 2 to 7 seeds. Garden jungle, Pulau Ubin.

*W. tenuiflora* Hook. fil. Changi.

*W.* sp. near *flavescentes*, with very small flowers. Corolla tube short and globose, lobes long. Changi (6023), Chan Chu Kang, Jurong.

*W. grandiflora* Dyer. Flowers larger than any other species 1½ inch long. I take this to be the plant intended for *W. grandiflora*, but note that the leaves are not thickly coriaceous, nor rounded at the tip as described. The mouth of the corolla tube is hairy. Rare. Reservoir woods.

*Lenconotis Griffithii* Hook. fil. "Akar Getah Sundek." A climber, but less thick than *Willughbeia* (not erect as stated in Fl. Brit. Ind.). Flowers orange fruit globular rather small. Not rare. Borders of woods, Jurong, Bukit Mandai, Selitar, Bukit Timah.

*L. Mainjagi* Dyer. Singapore (Maingay); not seen here.

*Melodinus orientalis* Bl. Climber, rare, Changi.

*M. micrantha* Hook. fil. Jalan Bray.

*Alxia lucida* Wall. "Puasari." Bark strongly scented as of new mown hay. Climber, flowers white fragrant. Bukit Mandai, Jurong, Kranji, Sungei Morai.

*Cerbera lactaria* Ham. "Buta-Buta." A large tree with white flowers and a pink eye and large ovoid reddish fruits. The white milk with which the tree abounds is poisonous and said to cause blindness if it falls into the eye. Very common in tidal rivers and swamps. Balestier plain, Selitar, Tampenis.

*C. odollam* Gaertn. Kranji, Changi.

*Kopsia macrophylla* Hook. fil. Shrub about 15 feet tall, flowers white with pink ring in centre. Chan Chu Kang.

(*Vinca rosea* L. has established itself in many places near the sea, and *Allamanda Schottii* Pohl. has run wild in a few places.)

*Alstonia scholaris* Br. "Palai." A tall tree, flowers green, branches in distant whorls. Common, Tanglin, Reservoir woods.

*A. spathulata* Bl. Jungle swamps, Cluny Road, Bukit Mandai.

*A. angustifolia* Wall. "Buta Buta Darat." Common woods, Bukit Timah, Changi, Kranji, Sungei Morai.

*A. grandifolia* Miquel. Singapore (Anderson); doubtful.

*Dyera laxiflora* Hook. fil. "Jelutong." A big tree with grey smooth bark, flowers small white. Pods very large and woody. Seeds thin flattened winged. Produces an inferior rubber. Common all over Singapore. Tanglin, Changi, etc.

*Tschorneavasana corymbosa* Roxb. "Jelutong Badak." A small tree with white flowers fragrant. Not very common, Changi, Reservoir woods, Choa Chu Kang.

*T. hirta* Hook. fil. Chan Chu Kang, Jurong.

*T. Malaccensis* Hook. fil. "Lada La-la jantan." A shrub with small white flowers and orange pods containing several seeds wrapped in crimson arils. Common in woods. Garden jungle, Changi, etc.

(*T. coronaria* Roxb. "Bunga susu." Is often cultivated and half wild near villages.)

*Pareosmia spiralis* Wall. Climber with greenish yellow flowers. Mangrove swamps. Not rare, Changi, Tampeuis, Selitar, Toas, Sungei Morai.

*Vallaris Maingayi* Hook. fil. A large tree with deep green leaves and large white flowers. Pods long and slender

containing many long-plumed seeds. Not common. Garden jungle.

*Strophanthus dichotomus* De C. "Bunga Hantu." A big shrub with large white flowers, with long claret-colored tails to the petals. Open country, Changi, Alexandra road.

*S. brevicaudatus* Wt. Smaller shrub with small deep purple flowers. Tanglin, Holland road, Balesier plain.

*Urecola Malaccensis* Hook. fil. "Getah grip tembaga." A climber flowers very small white. Produces a fairly good rubber. Thickets, Tyersall, Changi, Bedoh.

*U. Maingayi* Hook. fil. Rare, Kranji.

*U. brachysepala* Hook. fil. Bukit Mandai, Bukit Timah.

*U. tornifolia* Hook. f. Jungles, common, Tamponis, Changi, Chan Chu Kang.

*U. lucida* Benth. Changi, Pulau Ubin.

*Parmeria polyacra* Benth. Climber with pink flowers, Garden jungle, Cluny Road.

*P. glandulifera* Benth. "Singapore Lobb"; not seen.

*Aquosma marginata* Don. Singapore, (Fl. Brit. Ind.); not seen wild.

#### ASCLEPIADEÆ.

*Streptocaulon Wallichii* Wight. Singapore, Wallich in Fl. Brit. Ind.; but Wallich's No. 8249 is in the Catalogue "Penang et Singapore;" doubtless from Penang only, where it is common.

*Toxicarpus Griffithii* Don. "Singapore, Lobb"; certainly an error of locality.

*Genianthus Maingayi* Hook. fil. Very rare, Bukit Timah, (Cantley).

(*Catotropis procera* Br. Escape from cultivation, Toas, Changi, Pulau Ubin).

(*Asclepias curassavica* L. has established itself at Selitar, etc.)

(*Rophistemma pulchellum* Wall. Garden road; escape.)

*Sarcobatus globosus* Wall. Climber, flowers small yellow with brown streaks. Tidal river banks, not rare, Balestier plain, Alexandra road, Kalang Puding, Changi, Selitar river.

*Stephanotis Maingayi* Hook. fl. A splendid white flowered climber, flowers bigger than the garden Stephanotis. Very rare, Changi (Hullett), once collected.

*Tylophora tenuis* Wall. Slender climber, flowers pink. Hedges Blakang Mati, Green Hill, Alexandra road.

*T. Wallichii* Hook. fl. "Singapore, Wallich" in Fl. Brit. Ind., but No. 8194 B. in Wallich's catalogue is labelled Habit ignot.

*Cynanchum oralifolium* var. Bamboo Hedges, Cluny road, Balestier plain, Bukit Timah Road.

*Dischidia nummularia* Br. An exceedingly common creeping epiphyte draping orchard trees, and doing much damage. Stems very slender, leaves small and fleshy flowers white (scarlet as in Fl. Brit. Ind.). Whole island.

*D. hirsuta* Decne. Flowers red. Common in woods, Selitar, Chan Chu Kang, Kranji.

*D. albida* Griff. Flowers creamy white. Rare, Rajau.

*D. benghalensis* Colebr. A long creeping epiphyte, glaucous green often nearly leafless. Flowers creamy white, woods near the sea. Kranji, Sungei Buloh, Rajau.

*D. Rafflesiana* Wall. A very curious plant with some leaves developed into pitchers, green or often yellow, inside purple, flowers yellow. Common on trees especially near the sea. Tanglin, Blakang Mati, Teluk Kurau.

*D. collyris* Wall. A slender creeper on trees, leaves rounded buff yellow, above purple beneath, lying flat on the trees.

Flowers white. Ants often make their nests between the leaves and the branches of the trees. Common, Tanglin, Chan Chu Kang, Bukit Timah, Kranji.

*D. coccinea* Griff. Flowers scarlet. On lofty trees, Bukit Timah, Selitar, Choa Chu Kang. Very distinct from the last, of which Maingay suggested it was a variety.

*D. Wallichii* Wt. Wall. Cat. 8183. Is apparently a *Ficus*. *Hoya lacunosa* Bl. Flowers white. Not rare, Tanglin, Selitar, Bukit Mandai.

*H. revoluta* Wt. Singapore, Wallich 8160 B; not identified.

*H. latifolia* Don. A very large-leaved species, leaves often dull red, flowers small pink. The commonest species. Trees in dense jungle. Garden jungle, Kranji, Selitar, Pongol, Changi, Pulau Tekong.

*H. parasitica* Wall. Common near the sea, very floriferous, and pretty, flowers pink. Blakang Mati, Changi, Chan Chu Kang, Toas, Pulau Jahat.

*H. coronaria* Bl. The largest-flowered species. Flowers star-like and waxy opening white, with a yellow tint, then becoming spotted with pink and finally altogether pink. Common especially near the sea. Serangoon, Changi, Kranji, Pulau Tekong, etc.

*H. diversifolia* Bl. A pretty pink flowered species, often covering trees like a mat. Jurong, Chan Chu Kang, Kranji, Serangoon.

*H. coriacea* Bl. Flowers yellowish white. Rare, Tampenis (D'Almeida).

*H. obtusifolia* Wt. A very stout kind with thick oblong leaves. Flowers white with a pink centre, large, rarely produced. Serangoon, Changi.

*H. Finsburyii* Wall. Cat 8166. Leaves only, not identified.

*Physestes Wallichii* Wt. "Akar Siak." Slender climber with large thin creamy white flowers with a purple centre.

Roots scented like new mown hay. Rare, Tampenis river, Kranji, Toas.

*Leptadenia reticulata* Wt. "Singapore, Lobb;" evidently wrongly localised.

#### LOGANIACEAE.

*Fagraea cornosa* Jack (?) Epiphyte, Bukit Timah. Rare. Perhaps a new species, leaves large ovoid, flowers with a long tube in pairs.

*F. auriculata* Jack. A large spreading shrub, with enormous thick white trumpet-shaped flowers. The capsule is very large greyish green conic, splitting when ripe and showing the minute black seed in orange pulp. There are two forms: one has the flowers as large as in Miquel's picture, the other is much smaller. Not common, rocks overhanging the sea, Pulau Ubin.

*F. oborata* Wall. Not common, Kranji.

*F. racemosa* Jack. A big shrub or small tree with short, thick racemes of pinkish white flowers. Rare here. Pulau Ubin quarries.

*F. mindufolia* Bl. Shrub with slender racemes of pink flowers. Not uncommon. Bukit Timah, Kranji, Seltar, Sungai Loyang.

*F. ligustrina* Bl. A tree, leaves deep green small flowers slender creamy white with buff coloring in the throat, fragrant. Rare, Tampenis.

*F. fragrans* Roxb. "Tembusu." A large tree with cream yellow flowers, and orange berries. Well known for its timber. Sandy places, Changi. Abundant, Tanglin and other places near town.

*F. speciosa* Bl. A very much larger tree, with fewer and larger flowers. Garden jungle, Tyersall.

*Noristia malaccensis* Garden. A fairly large tree, flowers white. Garden jungle, Changi.

*Strychnos Tieu'e* Bl. "Ipoh Akar." A big climber with small tubular green flowers, fruit large globose gray green with a hard rind, seeds flat, enclosed in a bitter pulp.

Every part of the plant, even the flowers, is intensely bitter, from the presence of Brucine, nevertheless monkeys and musangs often eat the fruit. The bark is used by the Sakais in their dart poison. Common in thick jungle. Garden jungle, Chan Chu Kang.

*S. malaccensis* Benth. Not common. Toas, Garden jungle.

*S. pubescens* Clarke. Bukit Timah.

*Gaertnera Koenigii* Wt. var. *oocyphy'la* Wall. Singapore (Walllich); not seen.

*G. riminica* Hook. fil. Small slender shrub, with very small white flowers. Common, Garden jungle, Bukit Timah, Pulau Ubin, Changi.

*G. obesa* Hook. fil. An unbranched erect shrub with dark green leaves and heads of white flowers, berries pale blue. Common in jungles, Tanglin, Selitar, Bukit Arang, Toas, Sungei Bulub, Bukit Timah.

*G. grisea* Hook. fil. Not rare, Bukit Timah, Changi, Chan Chu Kang, Sungei Morai.

#### GENTIANACEÆ.

*Limnanthemum indicum* Thw. An aquatic plant with round floating leaves and a tuft of white flowers with a yellow centre. Reservoir.

#### BOBAGINÆ.

*Tournefortia Walliehii* De C. Climber, flowers green. Thickets, Bukit Panjang, Jurong, Bukit Mandai.

*Heliotropium indicum* L. A common weed in waste ground everywhere.

*Cordia myxa* L. Shrub, Chan Chu Kang, Pasir Panjang.

## CONVOLVULACEÆ.

- Erycibe malaccensis* Clarke. Not common, Chan Chu Kang.
- E. Princei* Wall. "Akar Kijang." Flowers white, coarsely scented, drupes black. Common, hedges, Tanglin, Juroong Kranji, Chan Chu Kang.
- E. Griffithii* Clarke. Not common, Garden jungle, Bukit Timah.
- E. coriacae* Wall. Not common, Changi.
- E. leucocyclaoides* King. A small-leaved climber, flowers white sweet. Thickets and woods, rarely flowering, common, Tanglin, Chan Chu Kang, Bukit Timah, Changi.
- Lettomania tomentosa*. "Akar Terong." Climber, with heads of white flowers with pink plaits, bracts pink, and fruit pink. Woods, Chan Chu Kang, Chua Chu Kang, North Selitar.
- Ipomoea digitata* L. A large pink convolvulus. Not rare, Bukit Timah Road, Loyang, Changi beach, Chan Chu Kang.
- I. angustifolia* Jacq. Small climber, flowers pale yellow or nearly white eye maroon. Common in grass, or bushes, Tanglin, Changi, Chan Chu Kang, Kranji.
- I. tridentata* Roth. Prostrate with slender stems, flowers small white. Sandy spots, Changi.
- I. linifolia* Bl. Twining and creeping in grass, flowers pale yellow. Common, Tanglin, Chan Chu Kang.
- I. chrysoides* Ker. Flowers in heads small lemon yellow. Waste ground, Tanglin, Government Hill, Bukit Timah Road, Bajau.
- I. biloba* Forsk. "Tapak kuda." Flowers large pink. Sea shores, common, Changi, Sungai Morai.
- I. denticulata* Chois. Flowers pink. Sea shores, Teluk Kurau.
- I. palmata* Forsk. Hedges, Tanglin, Sophia Road.

*I. sepia* Koen. White with a pink eye; *I. quinoclit* L. and *coccinea* with small scarlet flowers; *I. batatas* L. the sweet potato, "Keleli," flowers pink; and *I. aquatica* Forsk. "Kangkong," a white flowered aquatic eaten as spinach, occur as escapes from cultivation here and there.

*Evolculus alpinus* L. A little prostrate plant, flowers light blue. Sandy spots, Changi.

#### SOLANACEAE.

I doubt that any of these, except one *Solanum*, are native to Singapore.

*Solanum nigrum* L. Galang.

*S. torvum* Sw. Shrub with white flowers, the leaves smoked by Malays like tobacco. Waste ground, Tanglin.

*S. melongena* L. "Brinjal." Cultivated.

*S. sarmentosum* Nees. A prickly prostrate plant with blue flowers and black fruits, weed. Botanic Gardens.

*S. aculeatissimum* Jacq. "Terong Blanda." A prickly shrub with white flowers, and smooth red orange fruits. Sandy places, Tanjong Katong, perhaps wild.

*S. biflorum* Lour. Singapore (Wallich); more probably an error for Penang. It is a hill plant.

*Capicum frutescens*, L. *C. minimum*, and more rarely *C. grossum* Willd. are much cultivated, and the two first occasionally occur as escapes.

*Datura ferox* L. "Kachubong." Weed in waste ground, often planted for use in medicine. Tanglin, etc., Pulau Ubin.

#### SCROPHULARINEAE.

*Mazus rugosus* Lour. Small weed, flowers pale violet almost white in the centre of the lip, where are 4 or 5 yellow spots. Waste ground, Botanic gardens.

- Adenosma oratum* Benth. An aromatic herb about 2 feet tall with axillary pale blue flowers. Road sides, not rare, Tanglin, Chan Chu Kang.
- A. capitatum* Benth. "Kuching-Kuching." Aromatic, flowers in heads blue. Sandy fields, Tanglin, Chan Chu Kang, Jurong, Serangoon.
- A. ceruleum* Br. Singapore (Fl. Brit. Ind.); not seen.
- Linnophila conferta* Benth. "Bremi." A little aromatic herb with violet flowers, used in native medicine. Common in damp spots, Tanglin, Bukit Timah, Reservoir, Bukit Mandai.
- L. pulcherrima* Hook. fil. Wet spots, Selitar, Bukit Timah, Bukit Mandai, Chan Chu Kang, Jurong.
- Herpestes Monnierii* H. Bk. A small glabrous herb in wet spots, flowers white or blue. Common, Bukit Timah, Koohore, Serangoon, Teluk Kurau, Tampenis, etc.
- Arianema angustifolium* Benth. Singapore (Wallich 3885), not seen.
- Torenia polygonoides* Benth. Common little creeping plant in grass, upper lip of corolla red, lower white. Whole island, Tanglin, Changi, etc.
- T. mucronulata* Benth. Weed in Botanic gardens, Bukit Timah.
- Vandellia crustacea* Benth. "Kra Nasi." Common little weed with violet flowers. Paths and waste ground everywhere.
- V. seabrai* Benth. Flowers pink. Teluk Kurau.
- V. hirsuta* Benth. Little weed, hairy, flowers pale lilac. Garden weed.
- V. pedunculata* Griff. Wet spots, flowers pale violet. Government Hill.
- Bonnaya veronicifolia* Spreng. Wet spots, Chan Chu Kang, Ang Mo Kio.

*B. reptans* Spreng. Chan Chu Kang, Bukit Panjang.

*B. brachiata* Link. Chan Chu Kang.

*Scoparia dulcis* L. "Té Macao." A common weed with small white flowers. A tea for fever is made of it. Whole island.

*Striga lutea* Lour. "Rumput Siku-Siku." A little stiff erect herb in grass, flowers pink, or white here. Common, Tanglin, Changi, Chan Chu Kang.

#### LENTIBULARIÆ.

*Utricularia flexuosa* Vahl. "Lumut Ekor Kuching." Aquatic with bright yellow flowers. Pools, lakes, and ditches. Common. Garden Lake, Reservoir, Bukit Timah, Changi Road.

*U. exoleta* Br. Much smaller than the last. Garden lake, ditches Tanglin, Ang Mo Kio.

*U. bifida* L. A small erect plant with yellow flowers. Common in shallow ditches and wet sand. Bukit Timah, Chan Chu Kang, Reservoir, Bedok.

*U. affinis* var. *Griffithii*. A tall slender species with bright blue flowers. In shallow ditches, Changi, Tampenis, Bedok, Choa Chu Kang.

*U. racemosa* Wall. Very slender, with very small white flowers. Sandy spots towards Tanah Merah, Changi.

#### GESNERACEÆ.

*Aschynanthus Motleyi* Clarke. An epiphyte forming large tufts with pendulous branches, leaves pink on the back. Calyx lobes very narrow purple. Corolla green marked in the mouth with brownish red. Woods, not rare, Bukit Mandai, Kranji, Choa Chu Kang, Teban, Selitar.

*A. Lobbiana* Hook. Climbing epiphyte, flowers crimson scarlet showy. Common in damp woods, and mangrove swamps, Kranji, Toas, Chan Chu Kang.

*A. radicans* Jack. Creeping over rocks and trees, flowers crimson. Local. Bukit Timah, Choa Chu Kang.

*A. Wallichii* Br. Calyx short cup-shaped green, corolla crimson. Dense woods, Bukit Mandai, Kranji, Chan Chu Kang.

*Didymocarpus platypus* Clarke. A shrubby plant with white rarely bluish flowers, with a yellow spot in the mouth. Common, woods, Bukit Timah, Bukit Mandai, Chan Chu Kang, Changi.

*D.* sp. Very rare, two plants out of flower in a wooded ravine near Bukit Mandai.

*Cyrtandra bicolor* Jack. A shrubby plant, flowers white with brown or purple spots in the mouth. Leaves sometimes marbled white. *C. humilis* Bl. "Singapore, Prince," in Flor. Brit. Ind. is evidently the same thing. Damp ravines in wet jungle, usually very abundant. Bukit Timah, Bukit Mandai, Choa Chu Kang.

*C. pilosa* Bl. "Singapore Lobb," and *Cyrtandroura acuminata* Benth. Maingay and Lobb, in Flor. Brit. Ind. evidently errors of locality.

#### BIGONIACEÆ.

*Dolichandrone Rheedii* Seem. Shrub or tree with long tubular white flowers opening in the early morning and closing soon. Common. Tidal Rivers, Alexandra Road, Blakang Mati, Bajau, Ponggol, Pulau Ubin.

*Stereospermum chelonoides* De C. Tree. "Chachar." Rare, Bukit Timah.

*S. hypoleicta* Miq. Tree, flowers white or violet. Not rare, Tanglin, Bukit Timah, Bukit Mandai.

#### PEDALINEÆ.

*Sesamum indicum* De C. Til-seed. "Bijan." Weed in waste ground. Flowers pink rarely white. Cultivated for the seed, which is crushed for oil. Tanglin, etc.

## ACANTHACEÆ.

*Thunbergia alata* Bojer., climber with yellow or orange flowers with or without black eye, and *T. fragrans* Roxb. with white flowers, are common in hedges, being escapes from cultivation.

*Ebermannia Griffithiana* Anders. Dense jungle, Bukit Timah.

*E. setigera* Nees. Dense jungle, Bukit Timah, Chan Chu Kang, Chua Chu Kang, Jurong.

*Hygrophila salicifolia* Nees. "Chukal." Herb about 2 feet, flowers lilac, ditches, common. Garden lake, Tanglin, Bukit Timah road, Changi.

*H. quadrivalvis* Nees. Changi, Bukit Mandai.

*Ruellia repens* L. Erect or creeping in grass, flowers pale lilac with darker marks in the throat. Very common, Tanglin Changi, Bajau, Selitar, etc.

*Acanthus obliquus* Vahl. "Jeruju." A holly-leaved plant with white or blue flowers. Common in tidal mud, Kandang Kerbau, Tanjong Pagar, Alexandra Road, Changi, etc.

*A. rotundifolius* Wall. Twining, leaves not prickly flowers white. Not common, Bajau, Kranji, Chan Chu Kang.

*Asystasia istrusa* Bl. Straggling plant 3 feet tall or less, flowers pale violet. Hedges and thickets. Fort Canning, Government Hill, Tanglin, Chua Chu Kang.

*Eranthemum album* Nees. Flowers white, Jungles, local, Changi, Chan Chu Kang, Ponggol, Selitar, Choa Chu Kang.

(*E. Andersoni* Masters, described from a plant obtained in Singapore by T. Anderson, is only cultivated here.)

*Justicia andrographoides* Clarke. A straggling herb, with pale yellow flowers, leaves veined with white when young. Damp woods, Bukit Mandai, Chan Chu Kang.

*J. Gendarussa* L. "Ganda Rusa." A common shrub round villages, usually an escape from cultivation.

*Adhatoda vasica* Nees. "Singapore, Flor. Brit. Ind." Not seen even cultivated.

*Peristrophe ocellinata* Nees. Common herb with pink flowers. Ang Mo Kio, Choa Chu Kang, Tanglin.

*P. moutana* Nees. "Noja." Flowers pink, larger than the last. Leaves used for dyeing eggs, cakes, etc., pink. Tanglin, Blakang Mati, Jurong.

#### VERBENACEAE.

*Lantana Camara* L. "Tahi Ayam." All over Singapore, very common. There are several color varieties, the commonest is orange red color, turning orange yellow when passing over; another form is pale pink with a yellow eye turning darker pink, and where these two forms grow together there is an intermediate or hybrid form. There is a slight difference in the form of the lower lip in the two forms, in the orange one the lip is shorter and broader than in the pink one, where it is nearly quadrate, so that the pink flower appears more irregular than the orange one. The plant is a native of South America.

*L. indica* Roxb. A smaller shrub with lilac flowers, and dark pink fruits. Waste ground near town, abundant, Rochore, Kalang, Balestier plain.

*Lippia nodiflora* Rich. Prostrate herb, flowers lilac. Waste ground, Rochore.

*Stachytarpheta indica* Vahl. "Selasih Dende." Common shrub, flowers blue. Waste ground, everywhere.

(*S. suwalitii*, much bigger, with rosy flowers, introduced here and there.)

*Geunsia farinosa* Bl. (Wallich, No. 1836); not seen.

(*Callicarpa Reevesii* Wall. Singapore, Marton in Fl. Brit. Ind. is cultivated only.)

*C. longifolia* Lam. Shrub, lilac flowers and white fruit. "Tampoh Besih." Common in hedges, Bakit Timah, Tanglin, Ang Mo Kio.

*Premna*. "Buas Buas." A group of shrubs with small white flowers, and black drupes. All very closely allied and difficult to distinguish.

*P. cordifolia* Roxb. Tanglin, Thomson Road.

*P. parasitica* Bl. Changi.

*P. corymbosa* Roth. Climber, Garden jungle.

*P. flavaescens* var. *rubens*. Pasir Panjang.

*P. coriacea* Clarke. Jurong.

*P. integrifolia* var. *angustior*. A low prostrate plant, Serangoon River.

*Gmelina ramosa* Roxb. "Buhang." A thorny shrub, with large yellow flowers, fruit a yellow acid plum. Common, Tanglin, Changi, Teluk Kurau.

*G. Hystric* Kurz. occurs in the Garden road, possibly wild.

*Vitex trifolia* L. "Lagundi." Often planted, possibly wild at Bajau.

*V. Negundo* L. Bukit Timah Road, Bukit Mandai; probably an alien.

*V. pubescens* Vahl. "Alban." Tree, flowers blue, very common in secondary growth. Whole island.

*V. vestita* Wall. Tree, flowers yellow. Common in woods, Bukit Timah, Chan Chu Kang.

*V. gamosepala* var. Tree, rare, Changi.

*Clerodendron inerme* Gaertn. Shrub, flowers white stamens pink. Very abundant near the sea, Rochore, Changi, Selitar.

*C. disparifolium* Bl. "Guriam Padang." Small tree, flowers yellow, fruit black with a red calyx. The wood is used

for blackening the teeth. Very common in woods and thickets. Tanglin, Bukit Timah, Changi, etc.

*Ct. deflexum* Wall. A small shrub about 4 feet high with nodding heads of white flowers surrounded with numerous red sepals. Drupe black. Very common, Tanglin, Garden jungle, Chan Chu Kang, Tampenis.

*Ct. paniculatum* L. Shrub with brilliant crimson flowers. Mandai, Kranji. Doubtfully wild.

*Ct. villosus* Bl. Common shrub with white flowers. Whole island.

*Ct. myrmecophilum* Ridl. \* A slender shrub, with the stem hollow and filled with ants' nests. Panicles large, flowers orange. A handsome plant, rare, streams at Choa Chu Kang. Several cultivated kinds also occur in waste ground near villages; such are *Ct. fallax* Lindl. *Ct. squamatum* Vall. *Ct. fragrans* Vent. and *Ct. siphonanthus* Br. which is cultivated by Klings, who use the leaves for smoking instead of Hemp, and call it Ganja.

*Ct. ixoreiflorum* Hassk. A white flowered species, introduced into Java from Singapore about 1855, I know nothing of, and *Ct. Colebrookianum* Walp. "Singapore Lobl" and *Ct. infortunatum* Gaertn. mentioned from Singapore also in Flor. Brit. Ind. I have never met with.

*Sphenodesma pentandra* Jack. "Akar Sulong." Not common, Changi.

*Aricennia officinalis* Bl. "Api-Api." Very common in mangroves and along tidal rivers. River Valley Road, Changi, Pulau Ubin, etc.

#### LABIATÆ.

*Coleos atropurpureus* Benth. Flowers bright purple. Open country. Ang Mo Kio, Chan Chu Kang.

*Hypsis suaveolens* Poit. Very common in waste ground. Sepoy Lines, Tanjong Katong, Mt. Faber, Changi, etc.

*H. brevipes* Poit. Common, Tanglin, Ang Mo Kio, etc. Both of these are introductions from South America, now thoroughly established.

*Dysaphylla auricularia* Bl. "Ekor Kuching." Flowers pale lavender in long spikes. Very common in wet spots. Tanglin, Changi, etc.

*Anisomeles ovata* Br. Not common, Tanglin.

*Lencas zeylanica* Br. "Katumbet." A common weed with white flowers, waste ground. Tanglin, Blakang Mati, Selitar, etc.

*L. linifolia* Spr. Less common, Mt. Faber, Siglap.

*Ocimum basilicum* L. Basil. "Ruku-Ruku," often cultivated, occurs spontaneously in waste ground, as does also *Leonurus sibiricus* L. and *Leonotis nepetifolia* Br.

#### PLANTAGINEE.

*Plantago major* L. "Ekor Angin." Waste ground, Chau Chu Kang, Tanglin, etc.

#### NYCTAGINEE.

*Boerhaavia repens* L. Sandy places, Galang.

#### AMARANTACEE.

*Allmania nodiflora* Br. Sandy spots. Changi, common.

*Amarantus spinosus* L. "Bayam Duri." Common weed in waste ground. Tanglin, Rochore, etc.

*A. viridis* L. "Bayam Itek." Common in waste ground, everywhere.

*A. cundatus* L. Cultivated, and often as an escape.

*A. paniculatus* L. Government Hill.

*Cyathula prostrata* Bl. Not rare, weed in waste ground. Bukit Timah, Pulau Ubin, Teluk Kurau.

*Alternanthera sessilis* Br. Common everywhere.

*Pupalia atropurpurea* Miq. Singapore (Wallich in Flor. Brit. Ind., but in Wallich's Catalogue it is labelled 6933 L. Singapore et Penang). Not seen here by me.

#### POLYGONACEAE.

*Polygonum flaccidum* Meisn. Common in wet spots, ditches, etc. Tanglin, Bukit Timah Road, Rochore.

*P. pedunculare* Wall. Singapore. Wallich, not seen.

*P. barbatum* L. Ditches, Holland Road, Gaiang, Chan Chu Kang.

#### NEPENTHACEAE.

The pitcher plants are known to the Malays as "Poko Priok Krah," (ape's cups). The stems of the stouter kinds are used for binding fences. They always occur in open country, borders of woods, etc., and are absent from dense jungle.

*N. ampullaria* Jack. A common kind with the pitchers in whorls often sunk in the ground, pitchers green, or more or less spotted with purple. I once found a plant with ivory white pitchers. Tanglin, Chan Chu Kang, etc.

*N. Rafflesiana* Jack. Pitchers often very large. Common all over Singapore.

*N. phyllamphora* Willd. Not common, Changi, Jurong.

*N. Reinwardtii* Miq. Common, Bukit Timah, Changi.

*N. gracilis* Korth. Blakang Mati, Changi, Bukit Timah.

*N. albonarginata* Lobb. "Singapore, Wallich." Surely an error for Penang, where it is abundant.

#### ARISTOLOCHIACEAE.

*Aristolochia unguiflora* Mast. A climber with large trilobed leaves and purple flowers. Local in long wet grass. Jurong.

*Thottea grandiflora* Rottb. "Seburut." A low shrub, 2 feet tall with rough hairy leaves, and bell-shaped flowers as big as a tumbler, hairy with raised veins outside, smooth deep purple inside. A very curious plant. Common in dry jungles, Bukit Timah, Reservoir woods, Bukit Mandai, Chan Chu Kang, Bajau.

*Th. dependens* Klotsch. Rare, Sungai Buloh.

#### PIPERACEÆ.

*Piper (Mulderia) Maingayi* Hook. fil. Climber, rarely flowering. Common. Jungles, Bukit Timah, Chan Chu Kang.

*P. (Cubeba) sumatrana* Cas. Not common, Reservoir woods.

*P. pedicellatum* Wall. Rare, Chan Chu Kang.

*P. muricatum* Bl. An erect herb. Not very common, Bukit Timah, Chan Chu Kang, Jurong.

*P. (Chaciea) caninum* Bl. "Lada Bantu." slender climber, common in woods. Garden jungle, Selitar, Kranji, Pulau Tekong.

var. *lanata*. Less common, in more exposed spots. Siglap, Chan Chu Kang, Pulau Ubin.

var. *angustifolium*. Garden jungle, Changi.

*P. chaba* L. "Bakek." Cultivated. I have also what may be a wild form of this under the name "Bakek hutan" from Bukit Mandai, (5851).

*P. sarmentosum* "Chabei." "Kadok." An erect herb with long runners. Common in orchards, villages, etc., all over Singapore.

(*P. Betel* L. "Sirih," and *P. nigrum* L. "Lada hitam" are often cultivated.)

*P. miniatum* Bl. "Sirih Ayer." Climber, fruit-spikes red. Woods, not rare, Reservoir woods, Bukit Mandai, Toas, Chan Chu Kang.

*P. rostratum* Roxb. Erect, rare, Bukit Timah.

*P. porphyrophyllum* E. Br. A well known ornamental climbing plant, leaves deep green spotted white and pink. Common but rarely flowering, dense woods, Bukit Timah, Selitar, etc.

(*Peperomia exigua* Miq. A little weed in gardens, on walls, etc., introduced. Tanglin, Chan Chu Kang).

#### CHLORANTHACEÆ.

*Chleranthus officinalis* Bl. Shrublet, with slender spikes of white flowers and translucent white berries. Damp ravines in jungles, local but abundant. Bukit Timah, Bukit Mandai, Jurong.

#### MYRISTICACEÆ.

The wild nutmegs are very plentiful in Singapore, occurring in all the bigger jungles, but almost invariably in an isolated manner, so that it is often by no means easy to get both sexes of any species. They are all trees, varying in height from about fifteen feet to 100 or more. The seeds seem to be (in all but *M. cinnamomea*) deficient in aromatic properties, and are not used by the natives at all. The timber is often good. The native name for the cultivated Nutmeg is "Pala," the Mace being called "Bunga Pala," (literally flowers of Nutmeg). Many of the wild species are called "Pala Hutan," etc.; but "Pendarah," with the local variants Menarah, Mendarah, and Chendara, is the common name for other species.

*M. elliptica* Wall. Common, Bukit Timah, Bukit Mandai, Chan Chan Chu Kang, var. Bukit Mandai, Chan Chu Kang.

*M. hirsutula* De C. A very large tree, rare, Bukit Timah.

*M. cinnamomea* King. Not common, Bukit Mandai, Sumbawang, Changi, Selitar.

*M. crassa* King. Flowers orange, Garden jungle, Bukit Mandai, North Selitar, Sungei Morai.

*M. Lowiana* King. Rare, Kranji.

- M. iwers* Bl. Rare, woods, Bukit Mandai.
- M. ferruginea* Wall. (Cat. 6803.) Rare, Selitar.
- M. superba* Hook. fil. Rare, Sungai Bengkuang, Toas.
- M. rubiginosa* King. Rare, Garden jungle, Mt. Faber.
- M. Wallichii* Hook. fil. Bajau (3364), also collected by Cantley without locality.
- M. succosa* King. Rare, Kranji (6558).
- M. Farquhariana* Wall. Common, Garden jungle, Bajau, Selitar.
- M. Forbesii* King. Selitar.
- M. bivalvis* Hook. fil. Very rare, a single male tree in the Botanic Gardens, probably planted, but not known elsewhere.
- M. crassifolia* Hook. fil. Bukit Mandai, Chan Chu Kang, Bajau.
- M. Irya* Gaertn. Rare, Garden jungle.
- M. myrsinoides* King. Not rare, Tanglin, Cluny road, Bukit Timah, Selitar.
- M. brachiata* King. Singapore (Wallich); not seen.
- M. polystachys* Hook. fil. Not rare, Jurong, Chan Chu Kang, Kranji.
- M. oblongifolia* King. Rare, Bukit Timah.
- M. conferta* King. Bukit Mandai, Changi.
- M. Wrayi* King. Rare, Sungai Jurong.
- M. intermedia* Bl. The commonest species. Tanglin, Changi, Bukit Timah.
- M. tournefortia* Bl. Common, Garden jungle, Bakit Timah.
- M. glauca* Bl. Garden jungle, Kranji, Pulau Ubin.
- M. glaucescens* Hook. fil. Cluny Road.

*M. Hookeriana* Wall. Usually about 20 feet tall, with large leaves covered when young with brown wool which peels off as the leaves become coriaceous, fruit covered with brown wool. Not rare, Tanglin, Bukit Timah, Chan Chu Kang, Choa Chu Kang.

*M. Cantleyi* Hook. fil. Bukit Timah.

*M. longifolia* Wall. Bukit Timah.

*M. pendulina* Hook. The only tree of this species known is in the Botanic Gardens, but must have been planted.

#### MONIMIACEÆ.

*Matthea sancta* Bl. "Churom." A large shrub with small yellow flowers and steel blue fruits. The Jakuns smoke the leaves with tobacco to cure headaches. Common in woods and thickets. Garden jungle, Bukit Timah, Chan Chu Kang, Ang Mo Kio.

#### LAURINEÆ.

Trees, more rarely shrubs, with usually unisexual flowers. A difficult group, owing to the difficulty of getting flowers of both sexes and fruits, many being imperfectly known. The trees are usually called "Medang" by the Malays.

*Cryptocarya Griffithiana* Wt. "Medang Buaya." Medium sized tree, with hairy yellow flowers. Not rare, Tampenis, Changi, Selitar, river, Changi Teban.

*C. impressa* Meissn. "Munjuat." A tall tree. Rare, Garden jungle.

*C. ferrea* Bl. Chan Chu Kang, Choa Chu Kang, Bukit Mandai. And two other species.

*Beilschmiedia malaccensis* Hook. fil. Rare, Bukit Timah.

*Dehaasia microcarpa* Bl. Sungei Jurong.

*Cinnamomum javanicum* Bl. Not rare in dense woods, but very rarely flowering. Garden jungle, Bukit Timah, Ang Mo Kio.

*C. iner* Reinwdt. A medium sized tree, never tall, common in open country. The young leaves are red and yellow and appearing just before flowering give the tree a fine appearance. The flowers are yellow and fetid, the fruit blue-black. The bark is but feebly aromatic. Whole island, Tanglin, Changi, etc.

*C. nitidum* Bl. Very much like the last, but with larger flowers. Not common, Tanglin.

*Phabe opaca* Bl. A big tree, flowers yellow, fruits black on swollen red peduncles. Garden jungle, Bukit Mandai.

*Ph. declinata* Nees. "Singapore, Wallich." Not identified.

*Ph. sumatrana* Miq. Changi (1811).

*Machilus rimosa* Bl. Changi (4707).

*Alseodaphne decipiens* Hook. fil. Small tree, flowers yellow, fruit obovate green with white spots. Garden jungle, Chan Chu Kang.

*A. umbelliflora* Hook. fil. Not common, Selitar, Chan Chu Kang.

*A. costalis* Nees. and *A. lucida* Nees. collected in Singapore by Wallich Nos. 2594 B and 2590, are entirely doubtful plants.

*Actinodaphne prainosa* Nees. Botanic Gardens.

*A. Maingayi* Hook. fil. Dense woods, Bukit Timah.

*Litsea grandis* Bl. Near Tyersall, Bukit Mandai.

*L. amara* Bl. Jurong, Pulau Ubin.

*L. penangiana* Hook. fil. Common, flowers white, fruit white in a green cup. Woods, Tanglin, Bukit Timah.

*L. myristicafolia* Wall. Siglap, Changi.

*L. Paramanja* Ham. Rare, Garden jungle.

*L. longipes* Meissn? "Mullay." Rare, Balestier Road.

- L. ferruginea* Bl. Garden jungle, Bukit Arang.
- L. zeylanica* Nees. A large bush, common on the sea coast. Changi, Pulau Ubin, Bedoh.
- L. sulcifolia* Roxb. Garden jungle.
- L. polyantha* Juss. Chan Chu Kang, Kranji, Changi.
- L. petiolata* Hook. fil. Garden jungle.
- L. nitida* Bl. Bukit Mandai.  
And a number of unidentified species.
- Liudera malaccensis* Hook. ill. Small tree, flowers yellow. Abundant in woods, Garden jungle, Tanglin, Bukit Timah, Chan Chu Kang, etc.
- L.* sp. "Perawas." Tree, leaves used medicinally. Galang, Garden jungle.
- Cassytha filiformis* L. A leafless twining parasite. Common near the sea, Blakang Mati, Changi, Chan Chu Kang, etc.
- Hernandia peltata* Meissn. Singapore, Wallich No. 7811. Not seen.

## PROTEACEAE.

- Helicia petiolaris* Benn. Tree, common in woods. Bukit Timah, Jurong, Woodlands, Kranji, Changi, Garden jungle.
- H. excelsa* Bl. "Membatu Laiang." Not very common, Changi, Chan Chu Kang.

## THYMELEACEAE.

- Aquilaria malaccensis*. The Gaharu, is rare here. I have only seen it at Kranji.
- A. grandiflora*. Rare, Bajau.
- A.* sp. A medium sized tree with small white flowers and very small fruits. Garden jungle.

*Gongstylus Maingayi* Hook. fil. This aberrant tree is now referred by some botanists to Tiliaceæ. It occurs in the Garden Jungle, Bukit Mandai and Chua Chu Kang. *Wikstroemia indica*. "Singapore, Lobb;" doubtless an error.

#### SANTALACEÆ.

*Hemistowia Lobbianae* De C. Climber. Common near the coast, Changi, Kranji, Chan Chu Kang.

*H. buxifolia* Bl. Apparently a root parasite. It is a twiggy, often nearly leafless shrub, entirely bright yellow. Berry at first yellow, then red and finally black. Dry woods near the sea, Bajau, Changi, Kranji, Sungai Buluh.

*Scleropogrum Maingayi* Hook. fil. "Rukam puteh." A shrub or small tree with stout spines, flowers greenish yellow in dense spikes, fruit pear-shaped green juicy when ripe. Woods, not rare. Tanglin, Changi, Kranji, Bukit Mandai, Selitar.

*Champereia Griffithiana* Planch. "Chemperei." A shrub with white branches, small light brown flowers and orange fruit. The leaves are eaten as a vegetable, but it is said to be poisonous to dogs. Sandy spots on the coasts, Changi, Tampenis, Selitar, Bajau.

*Lindstromia paniciflora* Griff. A slender climber with light yellowish green flowers enclosed in greenish cream colored bracts. Common, Garden jungle, Blakang Mati, Bukit Timah, Changi, Loyang.

*L. scandens* King. "Akar kareh hitam." A scandent shrub or tall climber. Common, Garden jungle, Changi, Chan Chu Kang.

#### LORANTHACEÆ.

These parasites are often very destructive to trees in gardens. They are called by the Malays "Api-Api" or Senalu, with its variants Bendalu, Ndalu.

*Loranthus Lobbii* Hook. fil. A variety with red, not yellow flowers. Changi, Chan Chu Kang.

*L. coccineus* Jack. Bukit Mandai.

*L. ferrugineus* Roxb. Common, Tanglin, etc.

*L. longiflorus* Desr. Flowers crimson-scarlet. On a very lofty tree, Bukit Timah.

*L. pentandrus* L. A big stout plant, flowers light pinkish red; parasitic on *Eugenia*. Gardens, Alma, Bukit Timah, Chan Chu Kang.

*L. albidus* Bl. Flowers white, rare, Bukit Timah.

*L. retusus* Jack. On *Rhodomyrtus* and *Eugenias*, near the sea. Changi, Blakang Mati, Pulau Tekong, Jurong.

*L. ampullaceus* Roxb. Flowers green and black. Very common, Tanglin, Changi, Chan Chu Kang.

*L. crassus* Hook. fil. Gardens, Changi.

*L. Maingayi* Hook. fil. A very curious little flowered species, flowers brown. Rare, Kranji (6923).

*Viscum articulatum* Burm. Parasitic on *Loranthi*. Common, Tanglin.

*V. orientale* Willd. On *Ficus*, and *Macaranga javanica*. Common, Rochore, Bukit Timah, Jurong, Chan Chu Kang, etc.

#### EUPHORBIACEÆ.

*Euphorbia atoto* Forst. A shrubby plant, sea coasts, Changi.

*E. piutifera* L. "Gelang Susu." Common weed in waste ground, everywhere.

*E. thymifolia* Benn. Prostrate weed, waste ground, paths, etc. Common, Tanglin, etc.

(*E. Tirucollii* L. A large succulent shrub, often cultivated, occurs as an escape. The milk is used in native medicine, and for putting into the wounds made for marking

cattle to make the marks permanent. Said to be a native of Africa.)

*Agyneta bacciformis* Muell. A little shrubby plant, in grass, sea-shore, Teluk Kurau.

*Bridelia tomentosa* Bl. "Kenidai." Shrub or small tree. Garden jungle.

*B. pustulata* Hook. fil. Shrub. Jurong, Selitar.

*Cleistanthus liris* Hook. fil. Tree, Garden jungle, Changi.

*Cl. myrianthus* Kurz. Bushy tree with coppery leaves. Kranji road, near Stagmount, Jurong, Chan Chu Kang.

*C. hirsutulus* Hook. fil. Rare, Bukit Timah.

*C. macrophyllus* Hook. fil. Rare, Bukit Timah.

*C. nitidus* Hook. fil. "Singapore, Lobb"; doubtless Penang.

*Actephila javanica* Miq. Wallich 8016. A shrub with very small greenish white flowers. Common, Garden jungle, Bukit Timah, Bukit Mandai.

*Phyllanthus pectinatus* Hook. fil. "Laka, Malakka." A handsome tree with a trunk like a yew and elegant feathery foliage. The fruit a yellowish green angled drupe, acid, and used for preserves and in curries. The town of Malacca is said to take its name from the tree. Common in woods, Bukit Timah, Chan Chu Kang, Mandai.

*P. coriacens* Wall. "Singapore, Wallich 7946." Not seen only known from Wallich's collection.

*P. pulcher* Wall. *Reidia glaucescens* Miq. Small shrub, sometimes cultivated as an ornamental plant, possibly wild, but usually seen about cultivated ground. Tanglin.

*P. maderaspatensis* L. A small weed. Changi.

*P. nigruri* Wall. "Dukong Anak Merah." Common weed, waste ground, Tanglin, Galang, Changi.

*P. urinaria* L. "Dukong Anak." Common weed everywhere, used medicinally, and it is also supposed that after chewing a bunch of this plant it is possible to bite up glass with impunity.

(*P. distichus* Muell. *Cicca acidissima* is sometimes cultivated.)

*Glochidion*. Trees with inconspicuous flowers. "Ubah," of the Malays.

*G. littorale* Bl. Banks of tidal rivers. Chan Chu Kang.

*G. goniocarpum* Hook. fil. Not rare, Tanglin, Bukit Timah, Galang.

*G. dermogynae* Hook. fil. Rare, Bukit Timah, Selitar.

*G. insulare* Hook. fil. Not rare, Selitar, Bukit Mandai, Toas, Jurong, etc.

*G. bruneum* Hook. fil. "Ubah Merah." Gardens, Bukit Timah.

*G. desmodiumpum* Hook. fil. Not common, Tanglin, Bajan.

*G. berigatum* Hook. fil. Bukit Timah, Sungai Bruang, Bukit Mandai.

*G. microbotrys* Hook. fil. Tall tree with flaking bark. Flowers very small scented of cucumbers. Gardens, Chan Chu Kang, Changi, Pulau Ubin.

*G. superbum* Baill. Small tree with large leaves. Common in open country all over Singapore.

*G. leiostylum* Kurz. Common, Gardens, Selitar.

*G. coronatum* Hook. fil. Rare, Jalan Bray.

*Breynia rhomboides* Muell. Large shrub. Eskbank (Hullett).

*B. discigera* Muell. Rare, Upper Bukit Timah.

*B. reclinata* Hook. fil. "Hujan Panas." A shrub conspicuous from its bright red berries, but why called Hujan Panas,

lit., warm rain, no one seems to know. Very common, especially near the sea, Tanglin, Reservoir, Changi, etc.

*Smeucus albicans* Bl. "Chekop Manis." A small shrubby plant with dark green leaves with a white central blotch, red flowers and pink or white fruit. A popular native vegetable, leaves eaten as spinach. Waste ground, common.

*Cyclostemon longifolius* Bl. A tree with pendent branches and large leathery leaves. Rarely met with in flower. Common in woods, Garden jungle, Selitar.

*Choriophyllum malayicum* Benth. Sandy spots near the sea. Rare, Seremban; also collected by Wallich, 7975.

*Aporosa ficifolia* Baill. Not rare, Bukit Timah, Chan Chu Kang, Garden jungle.

*A. nigricans* Hook. fil. Tanglin, Bukit Timah, Bukit Mandai.

*A. Moingayi* Hook. fil. A shrub, Garden jungle, Selitar, Kranji, Jurong.

*A. fruticosa* Muell. A bush, common, Tanglin, Tanjong Gol, Chan Chu Kang.

*A. Praesana* King. Bukit Mandai, Selitar, Kranji.

*A. Beccariana* Hook. fil. Tree, about 40 feet tall, with red showy fruits. Not rare, Tanglin, Bukit Timah, Chan Chu Kang.

*A. lunata* Benth. Not common, Jurong.

*A. stellifera* Hook. fil. Garden jungle, Kranji, Bukit Timah.

*A. falcifera* Hook. fil. Not common, Jurong, Toas.

*Diphniphyllum laurinum* Baill. "Ruas-Ruas jantan." A big shrub or tree with white flowers, and olive shaped green fruits. Usually near the sea, Changi, Kranji, Teban, Siglap.

*Antidesma retiniosum* Bl. Shrub with racemes of pink fruits. Common, Garden jungle, Changi, Pulau Ubin, etc.

*A. cuspidatum* Muell. "Sebasah." A big shrub, common in thick woods, Bukit Timah, Changi, Bukit Mandai, Teban, Reservoir woods.

*A. fallax* Meisn. Not common, Bukit Timah.

*A. alatum* Hook. fil. Thick woods, common, Bukit Timah, Changi, Bukit Mandai, Jurong.

*A. bonias* Spreng and *A. ghesveldii* Gaertn. mentioned in Flora Brit. Ind. I have not seen wild.

*Buccarens*. A genus of trees of no great size, with flowers in long scented racemes. Fruit usually a capsule, orange colored or brown, splitting and disclosing the seeds enwrapped in an orange pulp hanging from the placentas; sometimes the fruit is a berry, and does not split. Most are more or less eatable though often acid.

*B. parryiflora* Muell. "Setambun." A small tree with a knotted stem, and very hard compact yellow wood, used for making sticks. The male flowers are borne in racemes in tufts on the stem, they are yellow and smell like cowslips. The female racemes are borne at the foot of the tree, so as to lie on the ground. The fruit is a spindle-shaped berry, claret colored and eatable though acid. A common plant. Tanglin, Bajau, Changi, etc.

*B. macrophylla* Muell. Tree small or medium. Fruits globose dull orange russet, pulp of seed orange, sweet. Garden jungle, Selitar.

*B. malayana* King. "Rambai." A well known fruit, common in cultivation and apparently also wild.

(*B. Malayana* King. "Tampoi." Occurs in cultivation but is not common.)

*B. bracteata* Muell. A small tree. Common, Bukit Mandai, Holland Road, Kranji.

*B. latifolia* King. Garden jungle (6264).

*B. sp.* B. in Flor. Brit. Ind. Garden jungle, Kranji.

*B. reticulata* Hook. fil. Kranji, Selitar.

*B. Kunstleri* King. A fair sized tree, fruits ochreous, with orange pulp. Common, Garden jungle, Selitar, Tanjong Gol.

*B. minor* Hook. fil. Fruit as big as a cherry, ochreous pulp orange. Garden jungle, Bukit Timah.

*B. symlocoides* King. A small tree, fruits orange, aril crimson. Garden jungle, Chan Chu Kang.

*B. sp.* Tree with narrow lanceolate acute leaves, flowers green. Garden Jungle (6263).

*Microdermis cascarifolia* Planch. A small tree, flowers bright yellow, berries red. Thick woods, common, Garden jungle, Changi.

*Gularia*. Low shrubs with long slender spikes of very small flowers, fruits white pulpy. The species are all very much alike and difficult to distinguish.

*G. affinis* Benn. Woods. Garden jungle, Changi, Bajau.

*G. Wallichii* Br. Changi (Hullett).

*G. subulata* Muell. Garden jungle.

*G. phlobocarpa* Br. The commonest species. Garden jungle, Bukit Timah, Chan Chu Kang, Pulau Ubin.

*G. sp.* with the leaves pubescent beneath, shoots and racemes covered with black pubescence. Changi, Siglap.

(*Jatropha curcas* L. "Jarak Blanda." Occurs in and near villages.)

(*J. gossypifolia* L. A garden escape, occurs here and there).

(*Aleurites Moluccana* Willd. Candle nut Singapore nut, Kamiri, Buah Kras, is often cultivated).

*Croton argyrratus* Bl. A shrub, leaves silvery beneath. Local, Batu Putih, Changi.

*C. conudatu* Geisel. "Tuku Takal." There are two forms, if they are not specifically distinct here, one a long stout woody liana with rough greenish capsules. Common at Tanglin, Chan Chu Kang. The other a scandent or erect shrub with erect racemes of white flowers and hard globose yellow capsules as big as a bullet.  
Common in open country. Tanglin, Bukit Timah, Bajau, Changi.

*C. Griffithii* Hook. fil. A common shrub in woods. Garden jungle, Bukit Timah, Sungai Buluh, Chan Chu Kang.

*C. elongifolium* Roxb. Bukit Mandai, Selitar.

*Trigonostemon longifolius* Baill. A small shrub. Not common, Chan Chu Kang, Kranji Road.

*Ostodes macrophyllus* "Kayu Julong." A tree, rare, Bukit Panjang (common in Malacca).

*O. muricata* var. *minor* and *Dimorphocalyx capillipes* Hook. fil. "Singapore Lobb"; evidently an error for Penang.

*Agyrostachys filipendula* Hook. fil. A big stiff shrub. A gum which exudes from the buds was formerly collected for making a resin for polishing sheaths of Kries. Local. Sandy spots near Changi.

*A. longifolia* Benth. var. *Malayana*, "Julong Julong." A low little or unbranched shrub, with large erect stiff leaves, used for thatching and wrappers. The Singapore plant is very different from that of Pahang and Perak, which is a much larger branched shrub. Common in woods. Tanglin, Sungai Buluh, Chan Chu Kang, etc.

*Claoxylon indicum* Hassk. A large shrub. Thickets, Grange Road.

*Cl. longifolium* Muell var. *brachystachys*. Woods, not rare, Bukit Timah, Pulau Ubin, Bukit Mandai, Chan Chu Kang.

*Acalypha indica* L. A weed, common in waste ground. Bajau, Galang, Pulau Ubin, Teluk Kurau.

*Celodopas ferrugineum* Hook. fil. A small tree with long slender yellow flower spikes, and capsules covered with brown wool. Garden jungle (5991, 6481), Bukit Timah.

*Alchornea villosa* Muell. "Ramin bukit." A big shrub, the bark used for string. Common in thickets and edges of woods. Bukit Timah Road, Reservoir woods, Chau Chu Kang, Bukit Mandai.

*A. rugosa* Muell. Common, Changi, Serangoon.

*Mallotus macrostachyus* Muell. A big shrub. Thickets, Bukit Timah Road at the 9th mile.

*M. Cochinchinensis* Lour. "Balik Angin." A small tree, pretty when in flower from its pendent white racemes. The under side of the leaves is white, so that when blown by the wind the whole tree appears white, whence the native name. A fairly good fibre can be obtained from the bark. Common in open country, Tanglin, Kranji, etc.

*M. pendangensis* Muell. Not common, Bajau, Toas, Sungai Morai.

*M. philippinensis* Muell. and *M. barbatus* Muell. given in Flor. Brit. Ind. as from Singapore; (the latter collected by Lobb) are doubtless errors.

*M. vernicosa* Hook. fil. "Singapore Botanical Garden, Cantley" is altogether doubtful.

*Macaranga hypoleuca* Muell. A fair sized tree with white stems and white undersides to the leaves. Sticks of its wood are used for setting gambier. Common in dry woods and secondary growth, all over Singapore. "Mahang putih."

*M. megalophylla* Muell. "Kubin." A fair sized tree with very large leaves. The wood used for making windmills, hence its name. Selitar, Choa Chu Kang.

*M. trichocarpa* Muell. A shrub half scandent, with irritating prickly capsules. Dry woods, common, Tanglin, Bukit Timah, Changi.

*M. javanica* Muell. "Mahang." A common tree all over the island with reddish inflorescence, and small capsules bifobed smooth, and covered with a waxy coat. It is doubtful whether this is the same as the Javanese species. Open country and secondary growth, exceedingly common.

*M. triloba* Muell. A medium sized tree, leaves entire or three lobed. Young plants have red leaves, and look very handsome. Abundant all over Singapore, in woods, Tanglin, Changi, Pulau Ubin.

*M. Lorii* King. Not common, Jurong, Tyersall, Chan Chu Kang.

*M. populifolia* Muell. Big tree, in woods, Bukit Timah.

*Ptychosperma costata* Miq. A big tree, flowers velvety yellow, fruit large green hairy wrinkled. Not common, Garden jungle, Chan Chu Kang.

(*Ricinus communis* L. "Jarak," Castor oil; occurs near villages.)

*Endospermum malaccense* Muell. "Sendok-sendok." A big tree, with smooth grey bark, flowers green very sweet, fruit as large as a pea, orange, sweet. The wood is used to make clogs. Not rare, Bukit Timah, Chua Chu Kang.

*E. chinense* Benth. Singapore, Wallich 7846; a doubtful specimen.

*Gelonium multiflorum* Juss. Woods, Changi, Bukit Timah.

*G. bijarium* Roxb. Sea coasts, Changi, Pulau Ubin.

*Megistostigma malaccense* Hook. fil. A stinging climber. Garden jungle.

*Homalanthus populifolius* Grati. Occurs here and there, about the Alexandra road and elsewhere, probably planted.

*Sapium discolor* Muell. A tall tree, very common, Tanglin, Jurong, Reservoir.

*S. indicum* Roxb., "Guring." Sea coasts, Kranji, Pasir Panjang.

*Excoecaria agallocha* L. A small tree full of poisonous milk, flowers green, very fragrant. Sea coasts, often growing between rocks. All round the coasts, Kranji, North Selitar, Toas.

*Sebastodes chamaerops* Muell. A herb. Sandy spots, Changi, Blakang Mati.

#### URTICACEAE.

*Trema orientalis* Bl. A common shrub in waste ground, Tanglin, Changi.

*T. angustifolia* Bl. Not common, Changi.

*T. timorensis* Bl. Very common, Tanglin, Chan Chu Kang.

*Gironniera nervosa* Planch. "Kasap." A big tree, with small bright orange-colored fruits. Common in woods, Tanglin, Chan Chu Kang, Changi.

*G. subaequalis* Planch. A big tree, less common, Tanglin, Chan Chu Kang.

*G. parvifolia* Planch. A small tree in dense jungle common in the hill districts of the peninsula, rare in Singapore, Bukit Timah, Kranji.

*Streblus asper* Lour. A climber with milky juice. Rare, Pulau Ubin.

*Sloetia sideroxylon* Teysm. "Tampenis." A big tree with dark brown heart wood, one of the best timbers in the region, being untouched by termites and unaffected by ordinary decay for a very long time. The wood when fresh cut exhales an unpleasant odor. Large trees are now scarce as the natives cut them when young to make carrying sticks, and gamblier stirrers, etc. There is a good deal of difference in the size of the leaves

according to the age of the tree. Young shoots from an old stump usually have large leaves, and it seems to me that *S. penangiana* Oliv and *S. Wallichii* King are mere states of *S. sideroxylon*, Teyson. The natives however certainly draw a distinction between some forms calling *S. Wallichii*, Tampenis putih and *S. sideroxylon*, Tampenis Merah, i.e. red and white Tampenis. The plant flowers very readily, even seedlings in a pot sometimes flower and fruit when only a foot and a half tall. The fruit is a soft white drupe enclosed in the four thickened white sepals. These are sweet and eatable and any pressure on them ejects the fruit to some distance so that if a bird attempts to eat them the fruit is thrown out.

Common in dry woods, open country, etc., especially the broad leaved var. *penangiana*, Tanglin, Chan Chu Kang, Changi, etc.

*Ficus*. The figs are tolerably well represented here, no less than 35 species occurring in the island. They comprise creeping shrubs, big climbers, erect shrubs from two feet tall to trees of great size. The figs, none of which here are eatable, are sought for by birds, especially pigeons, bulbuls and starlings, and by fruit-bats, which frequent the trees when in fruit in great numbers, and distribute the seeds everywhere. The common Malay name for any species of *Ficus* is "Ara." "Sipadik" is applied to many scandent species, and "Kelampong" to such trees as bear the figs clustered on the stem. Most of the trees are of rapid growth with soft valueless timber.

*F. pisifera* Wall. Small tree, figs white, common, Bukit Timah, Bukit Mandai, Pulau Ubin.

*F. urophylla* Wall. "Ara Supudeh." A shrub, often epiphytic on other trees and sometimes killing them, figs small orange. Very common, Tanglin, Bukit Timah, Chan Chu Kang.

(*F. bengalensis* L. A big tree, often planted.)

- F. bracteata* Wall. A medium sized tree, figs orange. Not rare near the sea, Changi, Batu Puteh, Chua Chu Kang.
- F. annulata* Bl. Climber or tree, figs large and orange. Rare, Bukit Timah.
- F. globosa* Bl. A bushy tree, figs dark green, common in thickets, Bukit Timah, Bukit Mandai, Changi, Toas, Reservoir.
- F. xylophylla* Wall. A small tree or epiphyte, figs 2 inches long orange with darker spots, very handsome. Not rare, Galang, Bukit Timah, Changi, Selitar.
- F. obtusifolia*. Rare, Pulau Ubin.
- F. altissima* Bl. Big tree. Garden jungle, Serangoon.
- F. consociata* Bl. Var. *Murtoni*. A tree or large shrub, figs orange. Not rare on the coast, Changi, Selitar, Ponggol, Bukit Timah.
- F. procera* Bl. A big tree. Fort Canning, Changi.
- F. microstoma* Wall. Not seen. Singapore, Wallich 4566.
- F. indica* var. *Gelderi*. An epiphyte or tree. Selitar, Pulau Ubin.
- F. sumatrana*. Tree. Chan Chu Kang.
- F. acampophylla* Miq. Big tree, not rare, Bukit Timah, Changi, Kranji, Bajau, Serangoon.
- F. binnendykii*. Mangrove swamps, Jurong, Kranji, Tampenis.
- F. obtusifolia* Roxb. Rare, Pulau Ubin (Hullett).
- F. Benjaminia* L. "Waringin." Commonly cultivated.
- F. glabella* Bl. Big tree, figs small white with pink spots. Chan Chu Kang, Bedok, Bukit Timah.
- F. retusa* var. *nitida*. Tree. Galang, Changi, Bajau.
- (*F. religiosa* L. Commonly planted.)

- F. pisiocarpa* Wall. A big tree. Government House Grounds, Tanglin, Changi, Chan Chu Kang.
- F. collicarpa* Miq. A big climber with flattened stem, figs very large, pear-shaped orange with paler spots, very showy. On big trees, common, Bukit Timah, Chan Chu Kang.
- F. pustulata* Thunb. Slender climber on old stumps. Tanglin, Chan Chu Kang, Selitar, Tanjong Gol.
- F. apiocarpa* Miq. Strong climber, figs pear-shaped large orange red. Tanglin.
- F. obscur-a* Bl. Figs yellowish white. Not rare, Bukit Timah, Chua Chu Kang.
- F. lericis* Bl. Rather rare, Bukit Timah, Pulau Ubin (Hullett), Chua Chu Kang.
- F. recurva* Bl. var. *ribesioides*. Bajau, Sungei Morai, Kranji, Chan Chu Kang.
- F. ramentacea*. Climber with yellow milk, figs bright pink. Dense woods, Bukit Timah, Chan Chu Kang.
- F. villosa* Bl. Climber, figs red or yellow, hairy. Tanglin, Bukit Timah, etc. Very common.
- F. diversifolia* Bl. Small shrub, terrestrial in sandy spots or epiphytic in mangrove swamps. Var. *ovoidea*. Very common, Changi, Kranji, Sungei Buluh, Teban, Selitar, Pulau Tekong.
- F. Miquelianii* King. Medium to large tree, figs green with whitish spots, at length dull red in clusters on the stem. Very common, Tanglin, Bukit Timah, Bukit Mandai.
- F. ribes* Reinwdt. Singapore, Wallich; not seen.
- F. fistulosa* Reinwdt. Bukit Timah, Changi, Chan Chu Kang Pulau Ubin.
- F. glandulifera* Wall. Tree with spreading crown, figs yellow. Not very rare, Garden jungle, Changi.

*F. alba* Reinwrdt. A shrub leaves lobed and large when young smaller and entire in older trees, white beneath, figs, yellow, becoming red. Very common in open country.

*F. chrysocarpa* Reinwrdt. A small shrub with rough leaves and golden hairy figs. Common in open country everywhere. Dr. King calls this 10 to 30 feet tall, and distinguishes it from *F. hirta* by the latter being small and having lobed leaves. I have never seen this more than 5 or 6 feet tall, and the leaves are never lobed.

*F. chartacea* Wall. A very slender shrub with very small yellow figs. The bark is used for string. Common in thick woods, Garden Jungle, Changi, Bukit Mandai.

*Artocarpus rigidia* Bl. "Tampunei." Monkey Jack. A very fine large tree with round yellow fruits covered with short spines and enclosing numerous seeds embedded in an orange colored sweet pulp. An excellent fruit. Tanglin, Changi, Chan Chu Kang.

*A. Kusstleri* King. "Getah Terap." A large tree, very variable in the shape of its leaves in young trees deeply lobed, in adults ovate oblong entire. The best is used for cordage, and as clothing by the Sakais. The milk is used as birdlime. Common all over Singapore.

*A. Lorii* King. Rare, Bukit Timah.

*A. Maingayi* King. Rare, Toas.

*A. Scortechinii* King. Not rare, Garden jungle, Kranji.

*A. lanceofolia* Roxb. "Keledang." A very large tree with excellent timber. Not common, Tanglin, Changi.

*A. Lakoocha* Roxb. "Tampang Ambong." Not rare, Bukit Timah, Chan Chu Kang, Tanglin, Changi, Pulau Ubin.

*A. Gomeziana* Wall. "Tampang." A medium sized tree. Fruits smooth round, yellow and shining outside, inside rose pink, eatable but sour.

*A. peduncularis* King. Rare, Bukit Mandai.

*A. integrifolia* L., the Jack, "Nangka;" *A. incisa* L., Bread fruit; and the "Sukun" said to be a variety of it; and *A. polyphema* Pera, the Champedak, are cultivated. The latter may possibly be wild at Changi.

*A. sp.* Large tree with pinnate leaves and fruit like that of *A. rigidia*, probably undescribed. Garden jungle, Pulau Ubin, Bukit Timah.

*A. sp.* Medium sized tree with small leaves, and small green fruits with white flesh  $1\frac{1}{2}$  inch long, seeds few. Garden jungle.

*Conocephalus surroolens* Bl. A big scrambling shrub with large leaves and compact heads of dirty white flowers, smelling of pears. Not rare, thick jungles, Bukit Timah, Bukit Mandai, Pulau Ubin.

*C. amara* King. Flowers pink. Dense jungles, Selitar, Pulau Ubin.

*C. Scortechinii* King, Singapore, Maingay, and *C. subtrinervius* Miq. collected by Lobb, probably erroneously localised.

*Fleurya interrupta* Gaud. A weed, sometimes stinging. Tanglin.

(*Pilea muscosa* Lindl. Introduced, common in waste spots in gardens, etc.)

*Pouzolzia indica* L. and var. *angustifolia*. "Ubai-Ubai." Used as a vegetable by the natives. A low weed, not very common, Bukit Timah, Chan Chu Kang.

*P. pentandra* Benn. A common weed, Tanglin, etc.

*Peltonia jarasica* Wedd. "Singapore Lobb," doubtless an error for Penang.

*Elatostema molle* Wedd. Singapore, Wallich 4633; probably an error for Penang.

*Pipturus mollissimus* Wedd. Shrub. Rare, Toas.

## JUGLANDÆ.

*Engelhardtia Wallichiana* Lindl. Tree with winged fruits.  
Rare, Garden jungle.

*E. serrata* Bl. Rare, Changi.

## MYRICACEÆ.

*Myrica Nagi* Thunb. "Gilinche." A small tree with dark green leaves and very small red drupes, much smaller than those figured in the Botanical Magazine t. 5727. Common on the sea coasts, Toas, Changi, Jurong, Blakang Mati; rarer inland, Bukit Timah.

## CUPULIFERÆ.

Oaks and chestnuts are very abundant in Singapore, and are usually fairly large trees, the timber however is usually remarkably poor and valueless. When in flower, the small green blossoms are visited by myriads of small blue-bottle flies, with red heads. The fruits are sought for and dispersed by squirrels.

*Quercus obovata* Korth. Not common, Garden jungle.

*Q. Wallichiana* Lindl. Jurong, Changi.

*Q. spicata* var. *graciipes*. "Berangan Padi." Bukit Timah, Pulau Ubin.

*Q. sundaca* Bl. "Mempening Bagan." Not rare, Changi, Tengah.

*Q. Lamponga* Miq. Our commonest species. A medium sized tree with leaves silvery on the back. Very common, Tanglin, Changi, Chan Chu Kang. A form passing into *Q. Eayekii* occurs in many spots. Seletar, etc.

*Q. hystrix* Korth. "Mempening." Common Bukit Timah, Kranji, Chan Chu Kang, Toas.

*Q. conocarpa* Oudem. Common, Garden jungle, Reservoir, Changi.

- Q. Bennettii* Miq. Rare, Garden jungle, Bajau.
- Q. Costleyana* King. Common, Tanglin, Bukit Timah, Chan Chu Kang.
- Q. lucida* Roxb. Common, Changi, Selitar, Bukit Mandai.
- Q. encleisocarpa* Korth. A big tree, acorns almost completely enclosed in the very thin cup. Common, Tanglin, Bukit Timah, Changi.
- Q. cyclophora* Endl. with very large disc-like acorns. Singapore, Wallich; not seen.
- Castanopsis javanica* De C. "Katek Tanga." "Berangan Gajah." A big tree with very large spiny chestnuts, uneatable. Common, Tanglin, Changi.
- C. Wallichii* King. Garden jungle, Bukit Timah, Chan Chu Kang. Changi, common.
- C. hystriz* Dr C. Rare, Toas.
- C. Hullettii* King. Involucres without spines but stout ridges on them. Nuts eatable and good. Garden jungle, Bukit Timah, Sumbawang, Bukit Mandai.
- C. sp.* Like the last, but the involucres are spiny, and leaves smaller. Garden jungle, Changi.
- C. nepheloides* King. Rare, Bukit Timah, Pulau Damar.
- C. sumatrana* De C. Singapore, Wallich 2762; not seen.

#### CASUARINÆ

*Casuarina equisetifolia* Forst, "Ru", is often planted, and was possibly wild here formerly.

#### CONIFERÆ.

*Dacrydium clavatum* Wall. "Singapore, Schomburgk" in Flor. Brit. Ind. must have been of course from a garden. The tree does not occur wild at much less than 2,000 feet altitude in the peninsula.

*Podocarpus neglectus* Bl. "Sintada." Common in mangroves, and all round the island, Kranji, Changi, Jurong, Serangoon.

*P. seriffolia* Don. Sea coasts, Changi.

*Agathis loranthifolia* Salish. Very rare, a few young plants in a wood near Changi. This Damar tree is usually to be met with only at an altitude of about 2000 feet in these latitudes, but both at Changi, and in the low country of Sisk, Sumatra, I have found small plants growing far in the jungle.

#### GNETACEÆ.

*Gnetum neglectum* Bl. A big climber, fruit apricot color. Common in forests, and in woods near the sea. Garden jungle, Chan Chu Kang, Kranji, Bajan, Pulau Tekong.

*G. macrostachyrum* Hook. fil. Not rare, Bukit Timah, Changi, Jurong, Seltar.

*G. fuscum* Bl. A big climber, the bark used for making string. Common, Tanglin, Sumbawang, Kranji.

*G. edule* Bl. Rare, near Seltar.

#### CYCADACEÆ.

*Cycas Rumphii* Miq. Sandy spots by the sea. Changi, Toas.

## MONOCOTYLEDONES.

## HYDROCHARIDEÆ.

*Hydrilla verticillata* Casp. A common water weed in ditches  
Tanglin, Chan Chu Kang.

*Blyxa malaccensis* Ridl. An aquatic with grassy leaves. Tang-  
lin, Chan Chu Kang.

*Enhalus Koenigii* Rich. "Setul." A marine plant with long strap-like leaves. The male flowers are very small and white, borne in a pair of large green boat-shaped bracts on the end of a long stalk. When fully developed the inflorescence rises to the surface, and the flowers break off and float away till they come in contact with a female flower which they fertilise. The sea is sometimes sprinkled all over with them. The female flowers are solitary in the bracts. After fertilization the stalk contracts into a spiral and the fruit is drawn down to the bottom of the sea to ripen. It is ovoid, green and hairy, about 1½ inch long. Malay children eat it. The Dugong (*Halicore*) lives mostly on the leaves of this plant. It is very abundant in shallow bays in the Johore Strait, round Blakang Mati and wherever the sea is shallow enough for it.

*Halephila ovata* Gaud. A small creeping marine plant with obovate leaves. Abundant in shallow bays in mud. Changi, Blakang Mati.

## BURMANNIACEÆ.

*Burmannia coelestis* Don. "Sisik Naga." A slender little plant with blue urn-shaped flowers, in grassy spots, common. Tanglin, Pasir Panjang, Mt. Faber.

*B. tuberosa* Becc. A small white saprophyte, usually almost completely buried in the ground. Flowers white with yellow corolla lobes, scented of cowslips. Damp

jungle in rotten leaves, Chan Chu Kang, Bukit Timah, Bukit Mandai.

*Thiomia Aseroe* Becc. A saprophyte, with urn-shaped flowers, the perianth lobes drawn out into tails yellow. Decaying leaves in wet jungles. Fairy point, Changi (Beccari), Bukit Timah, Kranji.

*Th. fumosa* Ridl.\* Somewhat like the last but smoky grey. Rare, Chan Chu Kang.

*Gymnosiphon borneense* Becc. An exceedingly fragile little plant, with lavender flowers. Dense jungles in rotten leaves, Bukit Timah, Chan Chu Kang.

#### ORCHIDÆ.

*Oberonia*. Small epiphytic orchids with ensiform distichous leaves and slender spikes of very small green, yellow or red flowers.

*O. dissitiflora* Ridl.\* Mangroves, Kranji.

*O. fusata* Lindl. On a high tree, Selitar, Bukit Timah.

*O. anceps* Lindl. Galang, Kranji.

*O. miriata* Lindl. "Singapore cultivated in Loddiges Garden," has not been seen here of late years, and is probably an error of locality.

*O. ciliolata* Hook. fil. Mangrove swamps and orchard trees. Kranji, Chan Chu Kang, Changi, Sungai Morai, Bukit Timah.

*Microstylis*. Terrestrial orchids, with the stems usually swollen at the base, thin-textured leaves, and small red green or yellow flowers.

*M. micrantha* Hook. fil. A creeping plant with a rather long cylindric stem, and lanceolate copper colored leaves, which "sparkle like the stone avanturine." Flowers very small red and yellow. On dead leaves, Bukit Mandai, Changi, Selitar.

*M. congesta* Rchb. f. Stem swollen at the base, flowers pink or green. Common in woods, Bukit Timah, Kranji, Sungei Pandan.

*Liparis renata* Ridl. The finest in the genus. Flowers fairly large, petals and sepals pink, lip with dark red veins. Terrestrial. Woods, very rare. Chan Chu Kang.

*L. verrosa* Lindl. Flowers yellow or purple. Terrestrial in swamps among grass in water Changi, Ang Mo Kio, near the Reservoir, Tanglin.

*L. elegans* Lindl. Epiphytic, with stiff leaves, and racemes of small yellow flowers with a red lip. Common on old stumps and trees near the sea. Selitar, Kranji.

*L. disticha* Lindl. Epiphyte. The flowers crowded to the end of the raceme with distichous bracts; small, opening one at a time, apricot colored. Common. Mangrove swamps. Kranji, Chan Chu Kang, etc.

*Platycelis longifolia* Hemsl. Epiphyte, forming large tufts, with conical pseudobulbs, long narrow leaves and long nodding spikes of brown flowers. It is easy to cultivate, and flowers all the year. Dry woods near the sea, Kranji, Sungei Jurong.

*Dendrochilum longicollis* Lindl.\* Epiphytic, forming a tuft of long slender pseudobulbs, bearing one leaf apiece, flowers solitary on long stalks with long filiform petals and a yellow lip. Rare, growing with the last. Sungei Morai. First discovered by Cuming.

*D. (Bolbitidium) punicum* Roxb. A little tufted plant with two leaves to each stem and one or two small flowers, yellow or veined with purple. Not rare on trees. Mangrove swamps, orchards, etc. Kranji, Bajau, Selitar.

*D. (Sect. *Lesmotrichum*) ionochophyllum* Hook. fil. Stems branched and swollen at intervals. Flowers small and fugacious, yellow with pink stripes. Common all over Singapore.

*D. criniferum* Lindl. Flowers yellow spotted purple, lip with

many yellow filaments on the end. Mangroves. Kranji, Sungei Morai, Changi.

- D. Kunstleri* Hook. fl. Flowers cream color with pink spots. Bukit Timah, Kranji, Changi.
- D. pulchellum* Ridl. \* Flowers yellowish white. Rare. Kranji.
- D. laciniatum* Ridl. \* Flowers yellowish. Rare, Pulau Selitar.
- D. (Sect. aporum) Serra* Lindl. Stems flat covered with opposite distichous triangular leaves sometimes red, flowers very small, white. Common, Kranji, Changi, etc.
- D. sinuatum* Lindl. Stems as the last, but leaves longer; flowers orange small. Common, Selitar, Kranji.
- D. cuthbertii* Ridl. Flowers yellow striped red. Common, Kranji, Bajau.
- D. rhizophorei* Ridl. Mangroves, Kranji, Sungei Buloh.
- D. atropurpureum* Miq. Flowers brownish red or yellow. Common, Tanglin, Kranji.
- D. Leonis* Rchb. f. A stout plant with triangular dull green flat leaves and fairly large yellowish flowers spotted red, scented of vanilla. On trees, common, Tanglin, Selitar, Bukit Timah.
- D. prostratum* Ridl. A smaller plant than the last, creeping on the trunks. Mangrove swamps. Kranji, Selitar, Sungei Blakaang.
- D. (Sect. strongyle).* This section has slender stems with terete curved leaves.
- D. teres* Lindl. Stems a foot tall, flowers white, an orange spot on the lip. Pretty but rare, on high trees, Toas.
- D. juncinum* Lindl. "Singapore Hort. Loddiges;" probably an error.
- D. aciculare* Lindl. "Singapore," probably an error.

- D. subulatum* Hook. fil. A small tufted plant, flowers white with pink veins. Bukit Timah, Bukit Mandai, Selitar.
- D. acerorum* Lindl. Common, Kranji.
- D. flexile* Ridl. Rare, Bukit Timah.
- D. (Sect. Virgatoe) conostachys* Rchb. f. Terrestrial, growing in water, with slender erect stems grassy leaves and small brown flowers. "Rumput Raja Sari." Changi, Bukit Mandai.
- D. villosum* Wall. Like the last but hairy. On leaves in dry woods, Bajau, Sungei Buloh, Kranji.
- D. (Sect. Bambusae-foliae) gemelum* Lindl. Epiphyte with long slender stems and pale yellow flowers. Common in mangrove swamps.
- D. penicille* Ridl. A very curious plant with long hanging stems, fleshy leaves and yellow flowers in pairs. Mangroves, Selitar.
- D. (Sect. clavata) tuberiferum* Hook. fil. Rare, Selitar, Toas.
- D. crumenatum* Sw. The "pigeon orchid." Very common all over Singapore.
- D. (Sect. distichophylla) bifarium* Lindl. A small plant with pale yellowish white flowers. Not rare, Tanglin, Toas, Selitar, Serangoon.
- D. pandaneti* Ridl. A curious plant with long creeping stems and grassy leaves, flowers fawn color and white. It always grows on Pandans, or Sagos, or Coconut palms, climbing up the stems. Bukit Mandai, Jurong.
- D. (Sect. breviflores) callibotrys* Ridl.\* A pretty plant with bunches of white flowers with a red and yellow lip, sweet scented. Rare, Toas, Sungei Morai.
- D. euphrileium* Rchb. f. Mangrove swamps, Kranji, Selitar, Toas.
- D. flavidum* Ridl. A tall slender plant with yellow or whitish flowers. Kranji, Jurong. Mangrove swamps.

*D.* (Sect. *Pedi'oum*) *pyropum* Ridl. A tall plant with bright orange flowers, fairly large. Very rare, Chua Chu Kang.

*D. lamellatum* Lindl. An odd plant with ovate flat thin stems and white flowers turning yellow. Damp woods, rare, Changi.

*D.* (Sect. *speciosa*) *Dalhousieanum* Wall. This well-known and grand plant has once been found on a big fallen tree in the forest at Chan Chu Kang.

*Bulbophyllum macranthum* Lindl. Flowers fairly large pink, spotted, scented of cloves. Common in woods.

*B. patens* King. Like the last but smaller. Chan Chu Kang.

*B. rugosum* Ridl.\* Flowers yellow. Not common, Chan Chu Kang.

*B. pilaeatum* Lindl. Selitar.

*B. striatellum* Ridl.\* Flowers very small, yellow. Not common, Chan Chu Kang.

*B. catenarium* Ridl. Abundant on mangrove trees. Sungei Buloh, Changi, Selitar.

*B. acicella* Ridl. On mangroves common, Kranji, Bajau.

*B. clandestinum* Lindl. Common on trees, Kranji, Tanglin, Sungei Morai, Selitar.

*B. concinnum* Hook. fil. Flowers small flame-colored. On mangroves abundant, Kranji, North Selitar.

*B. vermiculare* Hook. f. An inconspicuous little plant with greenish white flowers. Mangroves, Kranji, Selitar, Changi.

*B. adenopetalum* Lindl. "Singapore Hort. Loddiges;" is probably an error. It has never been found here again.

*B. apodum* Hook fil. Flowers small yellow in spikes, floriferous. Common, Kranji, Selitar.

*B. botryphorum* Ridl. Forms large tufts on trees, flowers in small pendulous bunches, purple. Mangroves, Kranji, Toas, Sungei Buluh.

*B. densiflorum* Ridl.\* A large long-leaved plant, flowers in bunches purple. Trunks of trees in woods. Selitar, Choa Chu Kang, Bukit Timah, Kranji.

*B. limbatum* Lindl. "Singapore, Loddiges;" locality doubtful.

*B. Trifolium* Ridl.\* A curious plant with pink flowers in a bunch like clover. Rare, Sungei Morai.

*B. stellata* Ridl. Flowers on a long slender stem in a terminal raceme opening singly at intervals, large yellowish and pink on trees in thick jungle. Bukit Mandai, Jurong, Choa Chu Kang.

*Cirrhopeplatum Medusae* Lindl. Flowers in a dense mop-like head, with long tails to the sepals, white with pink spots. Stems and branches of trees in jungle often very high up, or on rocks. Tanglin, Galang, Bukit Timah, Chan Chu Kang, Pulau Ubin.

*C. vaginatum* Lindl. Flowers pale yellow. On trees, common.

*C. concinnum* Hook. fil. Flowers cream with pink spots or entirely pink. Common, Bajau, Kranji, etc.

*C. gamosepalum* Griff. Common, Bajau, etc.

*C. acuminatum* Ridl.\* Rare, Choa Chu Kang.

*C. microbulbon* Ridl.\* Rare, Sungei Buloh.

*C. linearifolium* Ridl.\* Kranji, Bukit Mandai, Chua Chu Kang.

*C. semibifidum* Ridl.\* Rare, Kranji.

*C. makoyanum* Rehb. f. Rare, Chan Chu Kang.

*C. citrinum* Ridl. Flowers yellow. Kranji, Tanjong Gol.

*C. Blumei* Lindl. Mangrove swamps, Kranji, Chan Chu Kang.

*Eria obliqua* Lindl. A small plant with little white flowers. Mangroves, Kranji.

*E. floribunda* Lindl. Flowers in dense spikes white with pink lips, pretty common. Mangroves, Kranji, Sungei Buloh, Sungei Morai.

- E. tenuiflora* Ridl. Flowers thin yellow. Sungei Morai, Toas.
- E. bracteosa* Lindl. Trees, usually near the sea. Chan Chu Kang, Pulau Tekong, Pulau Selitar.
- E. pulicaria* Ridl. Rare, Changi.
- E. eudymion* Ridl. Flowers white, sides of lip purple. Rare, Selitar.
- E. nutans* Lindl. Common, Selitar, Toas, Kranji.
- E. neglecta* Ridl. Common, Kranji, Selitar, Sungei Buluh.
- E. longe-repens* Ridl. Not common, Sungei Morai.
- E. plicatella* Lindl. Common on trees or rocks. Kranji, Pulau Tekong, Sungei Morai.
- E. parvnea* Lindl. On trees. Common, Kranji, Chan Chu Kang.
- E. stellata* Lindl. Rare, Choa Chu Kang.
- E. striolata* Rehb. f. Rare, Kranji.
- E. vestita* Lindl. Not uncommon, Kranji, Sungei Brih, Sungei Morai.
- E. oligantha* Hook. fil. Local, Toas.
- E. velutina* Lindl. Common, Sungei Morai, Kranji, Jurong.
- Phreatia minnitiflora* Lindl. A very small plant with minute white flowers. Common in mangroves. Kranji, Toas, Jurong.
- Agrostophyllum meijus* Hook. fil. Common, Kranji, Selitar.
- Spathoglottis plicata* Bl. A terrestrial orchid with pink flowers very common in open country and on damp rocks. Tanglin, Bukit Timah, etc.
- Nephelaphyllum pulchrum* Bl. Terrestrial. Damp woods, Bukit Timah, Bukit Mandai, Sungei Brih.
- Plocoglottis porphyrophylla* Ridl. Terrestrial, leaves purple. Local, Kranji, Toas, Selitar.
- P. jaranica* Bl. Terrestrial, flowers red and yellow. Woods, local. Chan Chu Kang, Choa Chu Kang.

*P. foetida* Ridl. Wet woods. Bukit Timah.

*Cladaria viridiflora* Hook. fil. A creeping plant climbing up trees. Flowers large green. Common, Garden jungle, Bajau, etc.

*Coleogyne testacea* Lindl. Sandy places near the coast on trees and stumps or on the ground. Kranji, Choa Chu Kang, Sungei Morai.

*C. Rochussenii* De Vr. Not common, Selitar.

*C. Cumingii* Lindl. Bukit Timah, on high trees.

*C. Mayeriana* Rehb. f. Flowers green and black, on palm trees near the sea. Very local, Sungei Buluh, Kranji, on high trees, Bukit Timah.

*Calanthe curculigoides* Lindl. A beautiful terrestrial plant, with apricot orange flowers with red lips, in a dense spike. Common, Choa Chu Kang, Kranji, Toa Payoh, Bukit Timah.

*Dilechia Walliepii* Lindl. Singapore (Wallich No. 1952), has never been found again in the peninsula.

*Eulophia squarrosa* Lindl. Terrestrial, flowers pink and green. Open grassy spots, common. Tanglin, Changi, Choa Chu Kang.

*E. graminea* Lindl. "Bawang hantu." Common in sandy spots. Tanglin, Choa Chu Kang, Choa Chu Kang.

*Cymbidium aloifolium* Sw. Epiphytic. Common on the island and Pulau Ubin.

var. *pubescens* less common, Sungei Buluh, Jurong.

*Grammatophyllum speciosum* Bl. Rare, Toas, Pulau Ubin.

*Dipodium pictum* Rehb. Climbing on small trees, in woods. Common, Kranji, Choa Chu Kang.

*Bromheadia palustris* Lindl. Open grassy and sandy spots, very common. Flowers white, lip pink and yellow. Sweet-scented.

- B. sylvestris* Ridl. In dense woods, local. Kranji, Changi, Toas, Sungei Morai.
- B. a'ticola* Ridl. On high trees, common, Bukit Timah, Bukit Panjang.
- B. aporoides* Rehb. f. On lofty trees. Bukit Timah, Selitar.
- Polystachya singapurensis* Ridl. \*On trees near mangrove swamps, rare, Sungei Morai.
- Adenoncos rirens* Bl. A small epiphyte with green flowers. Common on mangroves, Kranji.
- Renanthera alba* Ridl. Local, Pulau Selitar and other islands round the coast.
- R. elongata* Lindl. Rocks, Pulau Ubin; Roadside, Bukit Timah.
- R. Maiugayi* Hook. fil. Pulau Selitar.
- Renantherella histrionica* Ridl. Rare. Mangroves, Seletar.
- Rhynchostylis gigantea* Ridl. Very rare, one plant on a tree at Selitar.
- Succotabium perpusillum* Hook. fil. A very small plant with minute white flowers. Common in mangroves, Kranji, Sungei Buluh.
- Microsaccus jarensis* Bl. Mangroves, Kranji.
- Teniphylloides serrula* Hook. f. A leafless epiphyte with long roots and small yellow and white flowers. Common, mangroves, orchard trees, etc. Tanglin, Toas, Kranji, etc.
- Cleistostoma latifolium* Lindl. Singapore, according to Lindley. Not seen.
- C. spicatum* Lindl. ? (*non allorum*). A common plant in the Peninsula. I am doubtful as to its identification with Lindley's plant. Not common, Jurong.
- Surcaanthus halophilus* Ridl. On trees by the sea, common, Kranji, Sungei Morai, Sungei Tengah, Pulau Tekong.

*S. densiflora* Par. *S. castanea* Ridl. Rare, on a tree, Dalvey road. This is figured by Dr. King, Ann. Bot. Gard. Calcutta Pl. 88 under the name of *Cleisostoma spicatum*, but it is not a *Cleisostoma* at all, as I understand the genus. Lindley's original description of *C. spicatum* is very short, but he says the flowers are pilose and the lip is longer than the spur, which does not apply to this plant.

*Sarcochilus calyptaris* Ridl. On tree trunks in dense woods. Bukit Timah, Chan Chu Kang.

*S. adnatus* Ridl. Very rare, Toas.

*Thrixsperma l'acinum* Rehb. fl. Scrambling among bushes and grass in swamps. Flowers lilac or white. Common, Selitar, Changi, Ang Mo Kio, Balestier plain.

*Th. calcicola* Rehb. f. Grows in great masses on the ground or on trees. Flowers white sweet fragacious. Common, Kranji, Sungei Morai, Bukit Timah Road, Pulau Ubin, Pulau Tekong.

*T. orchidites* Rehb. f. On trees, flowers yellow dotted red with very long tails to the sepals and petals. Rare, Selitar,

*T. notabile* Ridl.\* Leaves dull red, flowers pink, on trees. Rare Chan Chu Kang, Bukit Mandai.

*Dendrobium mucula* Ridl.\* Rare, Bukit Mandai.

*D. trichoglottis* Ridl. Very common on orchards, and gardens. A small plant with fragrant yellowish flowers. Whole island.

*D. filiformis* Ridl. Leaves long slender terete, flowers white. On orchard trees, rare. Bukit Mandai, Chan Chu Kang, Dalvey road.

*Acriopsis javanica* Reinw. Epiphyte with slender panicles of pink flowers. Trees, open country. Very common, Tanglin, Changi, Kranji, etc.

*A. Ridleyi* Hook. fl.\* Flowers yellow, very rare, one plant only found at Bukit Mandai.

*Pothecia microphyllus* Lindl. A small creeping epiphyte with white flowers, on mossy trees, common. Chan Chu Kang, Ang Mo Kio, Kranji.

*Appendicula bifaria* Lindl. Common on trees, Sungei Morai, Kranji, Bukit Timah.

*A. caerulea* Bl. Very common, Bukit Timah, Sumbawang.

*A. Leucisii* Griff. Singapore (Wallich); not seen.

*A. lucida* Ridl. Mangrove swamps. Common, Kranji, Chan Chu Kang.

*Thelasis elongata* Bl. Common, mangroves, Kranji, etc.

*Oceanthera elata* Hook. f. Mangroves, common, Kranji, Sungei Buluh.

*O. decurea* Hook. fil. Common, mangroves, Serangoon, Selitar, Kranji.

*Galeola*. Curious saprophytes with long straggling yellow branches, no leaves, and white or yellow flowers, growing among long grass or over stumps or tree trunks, or even over native huts.

*G. australis* Rehb. f. Not common, Chan Chu Kang.

*G. hydra* Rehb. f. Kranji, Sungei Buluh.

*Vanilla Griffithii* Rehb. f. Flowers white, fruit sweet, not vanilla scented. Local. Pulau Ubin.

*Corymbis longiflora* Hook. fil. A tall leafy plant about six feet tall with sweet white flowers. Damp woods. Pulau Ubin, Choa Chu Kang.

*Vrydagzynea albida* Bl. A small ground orchid, flowers white. Damp woods. Chan Chu Kang, Bukit Mandai, Choa Chu Kang.

*V. lancifolia* Ridl. Local, Bukit Timah.

*V. tristriata* Ridl. \* A very small plant, leaves reddish olive

with 3 pink stripes. Very wet spots in jungle, rare, Chan Chu Kang.

*Mocodes Petola* Lindl. Leaves bright green with gold veins. Rare, Selitar.

*Cystorchis curiegatu* Bl. Leaves apple green with darker markings. Common in wet woods. Chan Chu Kang, Bukit Timah, etc.

var. *purpurea*. Leaves purple. Choa Chu Kang.

*Hylophila mollis* Lindl. Wet woods, common. Chan Chu Kang, Choa Chu Kang, Bukit Timah, Kranji.

*Heteria obliqua* Bl. Rare, Bukit Timah.

*Aphyllorchis palliata* Bl. A leafless saprophyte, straw color. Not rare, Tanglin, Reservoir woods, Bukit Timah.

*Anectochilus geniculatus* Ridl. Leaves deep red with gold veins, Woods, Toas, Chan Chu Kang, etc.

*Cryptostylis arachnites* Bl. Rare, Bukit Timah, Pulau Damar.

*Pogonia punctata* Bl. Rare, Bukit Timah.

*Didymopetalis pallens* Griff. Leafless purplish saprophyte. Not common, Chan Chu Kang, Bajau.

*Lecanorchis malaccensis* Ridl. A black wiry leafless plant with pink flowers. Common in woods, Bukit Timah, Bajau, etc.

*Gastrodia javanica* Lindl. Rare, Chan Chu Kang, Bukit Mandai.

*Habenaria singapurensis* Ridl. \* Very rare, Choa Chu Kang woods.

*H. bicarinata* Benth. Small white flowered ground orchid. Common along paths, in grass, etc. Whole island.

*H. Maingayi* King. \* "Singapore Maingay." I have not seen this, and hardly see how it differs from the last, which is a somewhat variable plant.

## APOTASIACEÆ.

*Apostasia nuda* R. Br. Shrubby plant with narrow leaves and small white flowers. Very common in dry woods, Bukit Timah, etc.

*Newciedia Lindleyi* Rolfe. A tall handsome plant with bright yellow flowers. Not rare, Bukit Timah, Chan Chu Kang, Chua Chu Kang.

*N. Curtisii* Rolfe. Rare, Changi, Kranji. This is the *Topistra singapuriiana* of Wallich's Catalogue.

*N. Griffithii* Rehb. f. Stems creeping, flowers white. Wet spots. Bukit Timah, Bukit Mandai, Sungei Morai, Chan Chu Kang, Jurong.

## SCITAMINEÆ.

The Gingers have already been described in a previous number of the Journal.

*Globba panicoides* Miq. Woods, Bukit Timah, etc.

*Gl. uliginosa* Miq. Bukit Mandai.

*Gl. leucantha* Miq. Bukit Timah, Chan Chu Kang.

*Curcuma zedoaria* Rosc. Abandoned gardens. Reservoir, Bukit Mandai, etc.

*Costus speciosus* Sm. Common, Jurong, Bukit Timah, etc.  
var. *argyrophyllus* Bukit Timah.

*C. globosus* Bl. Rocky places, Bukit Timah.

*Zingiber zerumbet* Sw. Waste ground.

*Z. gracile* Jack. Bukit Timah.

*Z. puberula* Ridl. Common, Bukit Timah, Serangoon, Bajau.

*Z. Griffithii* Bak. Bukit Timah.

*Amomum hastilabium* Ridl. Bukit Timah, Selitar.

*Horistedia scapha* Retz. Common, Tanglin, Bukit Timah.

- H. Leonurus* Retz. Common. Tanglin, Bukit Timah, Bukit Panjang.
- H. megalochilus* Ridl. Rare, Bukit Mandai.
- H. coulei* Ridl. Rare, Bukit Panjang.
- H. Mairgazi* Ridl. Local, Bukit Timah, Sungei Buluh.
- Plagiostachys lateralis* Ridl. Local, Bukit Timah, Bukit Mandai, Reservoir woods.
- Elettariopsis latiflora* Ridl. Common, Bukit Timah, Kranji, Sungei Buluh.
- Alpinia melanocarpa* Ridl. Sandy spots near the sea. Kranji, Selitar.
- A. Galanga* L. Waste ground and gardens.
- A. Rafflesiana* Wall. Not common, Sungei Buluh, Changi, Toas.
- Donax grandis* Ridl. Bukit Timah, Bukit Panjang.
- Phrynum Griffithii* Bak. Common, Bukit Timah, Jurong.
- (*Canna indica* L. and *C. Wareezezii*. Garden escapes. Tanglin, etc.)

#### OPHIOPOGONEÆ.

- Peltosanthes violacea* Wall. Dense woods, Bukit Timah.
- P. viride* Ridl. Common, Chan Chu Kang, Ang Mo Kio.

#### AMARYLLIDÆ.

- Curculigo recurvata* Dryand. "Lumbah." Common in open country, Bukit Timah, etc.
- C. latifolia* Dryand. Very common and variable. All over the Island.
- C. villosa*, Wall. *C. latifolia*, var. *villosa* Bak. This is a very distinct species from *C. latifolia*. The leaves are narrow lanceolate acuminate caudate stiff, glabrous above, cobwebby

beneath  $2\frac{1}{2}$  feet long and 5 inches wide with a petiole one foot long. Spikes 2 inches long, bracts stiff oblong obtuse green, with the points recurved, something like the spike of a *curcuma*. Flowers orange yellow  $\frac{1}{4}$  inches across. Sepals lanceolate acute petals shorter and blunter. Fruit with beak one inch greenish white. Seeds few black about half as big as those of *C. latifolia* Dry. Not rare, in long grass and secondary growth. Bukit Timah, Tanglin, Chua Chu Kang.

*Crinum asiaticum* L. "Bakung." The common white sea shore *Crinum*. *C. pedunculatum* Br. is said to differ in the long-pedicelled flowers and elongate root stock. I have only seen one species in Singapore and Penang, and that has long pedicelled flowers and no root stock. The flowers open about 6 p. m. and are sweet scented, and very attractive to hawk moths. Sea coasts, Kranji, Selitar, Pulau Ubin.

*Euryclodes sylvestris* Salisb. Is probably native here. It occurs in the sea sand at Changi, Bajau, etc., and is often cultivated.

#### TACCACEÆ.

*Tacca cristata* Jack. Common in woods, Bukit Timah, etc.

#### DIOSCOREACEÆ.

*Dioscorea darmanii* Roxb. "Gadung." A fairly large climber with prickly glaucous stems. The tubers sliced and washed in running water are eaten, but unless so washed are stated to be poisonous. Common in villages; I have never seen it elsewhere.

*D. pyrifolia* Kunth. Common, Bukit Timah, Chan Chu Kang, Bukit Mandai, Sungei Pandan.

*D. oppositifolia* L. Garden jungle, Selitar, Bukit Mandai Road.

*D. laurifolia* Wall. Woods and edges of jungles, common, Tanglin, Sungei Morai, Bukit Timah, Changi.

*D. deflexa* Hook. fil. "Singapore Maingay"; not seen.

*D. polyclades* Hook. fil. Not common. Sungei Pandan.

*D. glabra* Roxb. Tanglin, Bukit Mandai.

*D. sativa* L. "Ubi Kistala." Waste ground and hedges, common.

(*D. alata* L. The yam is often cultivated.)

#### ROXBURGHIACEÆ.

*Stemona tuberosa* Lour. Not common, Bukit Timah.

#### LILIACEÆ.

*Smilax colophylia* Wall. A dwarf erect shrub with yellow flowers and red berries. Common in dense jungle. Garden jungle, Changi, Bukit Mandai, Bukit Timah, etc.

*S. myosotiflora* A. DC. Slender climber flowers green. Rare, Garden jungle, Chan Chu Kang.

*S. megacarpa* Roxb. Not common, Garden jungle, Bukit Timah.

*S. harbata* Wall. A strong climber with bristly stems. Common all over Singapore, Tanglin, etc.

*S. lancephylla* Bl. with large lanceolate acuminate leaves broad at the base, smooth unarmed stem, and large flowers in solitary umbels on stout peduncles 2 inches long. Rare. Tanjong Katong (Hullett), Bukit Mandai, Bukit Timah.

*Dianella ensifolia* Red. "Lenjuang." Herb, flowers yellowish and fruit white, or flowers and fruits blue. Common all over Singapore.

*Dracena granulata* Hook. fil. A tree about 20 feet tall with stems about 4 inches through, leaves narrow and dark green, flowers white in large panicles. A beautiful tree. In Journ. Bot. Apr. 1896. I confused this with *D. graminifolia* Wall, a low shrub occurring in the Dindings. Wet jungles, Bukit Timah, Bukit Mandai, Choa Chu Kang.

*D. terniflora* Roxb. A low shrub. Common, thick jungles, Garden jungle, Selitar, Changi, Pulau Ubin.

*D. Porteri* Bak. Common in thick jungles. Garden jungle, Jurong, Chan Chu Kang, Pulau Ubin.

*D. aurantiaca* Wall. *D. Cantleyi* Bak. A shrub little or not branched, leaves green or purple with lighter rings. Flowers purple rarely white, fruit orange. Damp spots all over Singapore, common, Tanglin, Bukit Timah, Selitar, etc.

*D. Maingayi* Hook. fil. A big tree. Sandy spots near the sea. Changi, Sungei Morai, Bukit Panjang, Toas.

*D. singapurensis* Ridl.\* Woods, Chan Chu Kang, Bukit Timah.

*E. gracilis* Wall. Common in jungles, Garden jungle, Chan Chu Kang, Bukit Mandai.

(*Cordyline terminalis*, the Dracena of Gardens, is not wild anywhere in the peninsula, it is cultivated only.)

#### PONTEDERIACEÆ.

*Monochoria hastifolia* Presl. Aquatic, flowers light blue. Common, Galang, Ang Mo Kio.

*M. vaginata* Presl. Flowers dark blue. Common in ditches all over Singapore; the var. *plantaginea* is even commoner.

#### PHILYDRAEAE

*Philydrum lanuginosum* Banks. Locat. Wet sandy spots, Bedoh.

#### XYRIDEAE.

*Nygris anceps* Lam. A tufted grassy plant with terminal cones of brown bracts, with fugacious yellow flowers. Sandy places, Balestier, plain Macpherson road, Changi, Pulau Tekong.

*X. schenoides* Mart. Balestier plain, Reservoir.

## COMMELINACEÆ.

*Pollia sorzayonensis* Endl. Herb, flowers white. Jungle, Pulau Ubin.

*Commelina nudiflora* L. "Rumput Aur," Common weed with blue flowers opening in the early morning and soon withering. Common all over Singapore.

*C. benghalensis* L. Weed in cultivated ground, flowers blue. Tanglin, Galang.

*Aneilema nudiflorum* Br. Small weed with pink flowers, waste ground, Tanglin.

*A. vaginatum* Br. Telok Kurau.

*Forrestia mollis* Hassk. "Setawa." A tall erect plant about 4 feet high, with white flowers and pink capsules. Common in jungles, Bukit Timah, Tanglin, Tampensi, Reservoir, Pulau Ubin.

*F. marginata* Hassk. Stout creeping plant, flowers white. Capsule purple. Rocks, Bukit Timah.

*Cyanotis cristata* C. B. C. Sandy shores. Changi, Teluk Kurau.

*Floscopa scandens* Lour. Damp spots, Tanglin, Galang.

## FLAGELLARIEÆ.

*Flagellaria indica* L. "Rotan Binni." Stems used for making baskets. Common in mangrove swamps and other places near the sea. Bajau, Changi, Pulau Ubin.  
var. *minor* Jurong, Selitar, Bajau.

*Susum antechinicum* Bl. Common in jungle. Bukit Timah, Chan Chu Kang.

## PANDANEEÆ.

*Pandanus atrocorpus* Griff. "Mengkuang." The biggest species here, often 40 feet high with very long leaves used for Kajangs, and ataps, baskets, hats, etc. Common all over Singapore, in swamps.

*P. Houlietii* Carr. About 15 feet tall, leaves large, dark red when young. Dense jungle, Bukit Timah.

*P. fasciculata* Lam. "Pandan Duri." A large much branched plant, with heads of fruit as large as a man's head, bright orange. Sea coasts, and often planted. The leaves used for mats and baskets. Common, Changi, Bajau, Blakang Mati, Pulau Ubin.

*P. ornatus* Kurz. A bush with narrow glaucous leaves. Bukit Timah.

*P. tenuis* Rumph. "Pandan Jelinkeh," with glaucous unarmed leaves, is often cultivated, the leaves used to flavour rice, and as a perfume.

*P. parrisii* n. sp. *Pandanus* 15 Hook. Fl. Brit. Ind. Vol. vi. 487.

This has never been completely described nor named so I give a description of it here. Stem 3 feet tall or less, and  $\frac{1}{2}$  inch in circumference erect grey, emitting long slender roots from all parts often producing shoots at the base seldom branched higher up. Leaves a foot long and 3 inches wide abruptly caudate acuminate, the point 2 inches long very slender dull green above glaucous beneath rather thin in texture, spines very small numerous on the edges and keel at the apex, none on the keel at the base of the leaf. Male spadix six inches long, rachis white. Bracts oblong boat-shaped keeled mucronate lowest 4 inches long, the inner one inch long in the two lowest bracts which are empty, the upper bracts smaller with the keel, edges, and point green and armed with short stiff spiny bristles. Flowering bracts 7, softer than the lower ones ivory white spinulose ovate to ovate lanceolate, the terminal one flat lanceolate barely  $\frac{1}{2}$  an inch long. Spikes 5 shorter than the bracts except the terminal one  $\frac{2}{3}$  inch long. Stamens free very slender  $\frac{1}{6}$  inch long. Female spadix solitary globose about  $1\frac{1}{2}$  inch long carpels conic rather abruptly passing into a long brown shining upcurved spine nearly  $\frac{1}{4}$  inch long.

Dry woods, common. Bukit Mandai, Bidadari, Changi, Kranji, Sungei Pandan, Pulau Ubin. Also occurs in Johore,

Perak, Sungai Ujong and Malacca. This is a very distinct little species, and one of the smallest known to me. The male plants are very rare. I have only met with one, and have never seen ripe fruit.

Three other Pandans occur here which I cannot at present identify.

*P.* near *P. helicopus* Kurz. but with very short styles to the fruit, leaves broad and very thorny at the tip. Woods, Bukit Timah.

*P.* sp. Stems slender about 5 feet tall much branched, leaves narrow fruit cylindric 3 inches long and one inch through. Carpels small narrowed into a single curved spine. Streams, Bukit Mandai, Bukit Timah.

*P.* sp. A tall plant about 10 feet high, with long glaucous leaves  $1\frac{1}{2}$  inch broad, tips deflexed. Fruits about 5 in a spike subglobose on a stout peduncle, each 3 inches long, carpels acuminate into a long spine conic, orange color. Forming large thickets in swamps near Bukit Mandai on the road to Kranji.

*Freycinetia angustifolia* Bl. A slender climber with narrow leaves, often covering trees like a mat. Spathes apricot orange. common, Garden jungle, Bukit Timah, Kranji.

*F. Gaulichaudii* Benn. Leaves broader spathes yellow. Common, Bukit Mandai, Bukit Timah, Kranji.

*F. insignis* Bl? A very stout climber much bigger than the others. Thick woods. Garden jungle, Chan Chu Kang, Chua Chu Kang.

#### PALMÆ.

(*Areca Catechu* L. "Pinang." Betel-nut. Commonly cultivated, it does not seem to be known wild anywhere.)

*Pinanga coronata* Bl. Rare, Selitar.

*P. disticha* Bl. A dwarf palm with mottled leaves. Rather rare, Selitar.

*P. Malaiana* Scheff. A tall slender palm. Chan Chu Kang woods.

*P. paradoxa* Scheff.? Rare, Chan Chu Kang. The only specimen I have closely resembles this plant which is otherwise a native of our hills at 2,000 feet upwards.

*P. polymorpha* Becc. "Singapore Lobb;" doubtless an error for Penang.

*Nenga Wendlandiana* var. *Moluccensis*. "Pinang Umu." About 15 feet tall fruit black on a red spatix. Flowers cream colour. Wet woods common, Garden road, Chan Chu Kang.

*Ptychosperma singaporense* Becc. "Kerintin." A tufted palm about 10 feet tall. Abundant in dry woods, Garden jungle, Bukit Timah.

*Cyrtostachys Lakka* Becc. The sealing-wax palm. "Pinang Rajah." Wet places near the sea, common, Kranji, Toas, Chua Chu Kang.

*Oncosperma horrida* Scheff. "Bayas." A big thorny palm, common in dense jungle. Garden jungle, Bukit Timah.

*O. tigillaria*, *Areca tigillaria* Griff. "Nibong." Like the Bayas, but with drooping leaves, and smaller fruit. Quite distinct from the Javanese *O. filamentosa* Bl. which is made a synonym in Flor. Brit. Ind. The wood is used in building and for many other purposes. Common usually near the sea, Kranji, etc. The Malays distinguish several other species under the names of Lenou, Ibas, and Bayas Padi, but they do not seem to me to be specifically distinct.

*Iguanura geonomiformis* Becc. Not common. Streams in thick jungle, Bukit Timah, Bukit Mandai.

*I. Malaccensis* Becc. Rare, Chan Chu Kang.

*I. Wallichiana* Hook. fil. "Singapore Lobb"; evidently an error for Penang.

(*Arenga saccharifera* Lalill. "Kabong." Sugar palm, is commonly cultivated.)

*Caryota mitis* Lour. "Tukus." Common in woods, Grange Road, Bukit Timah.

*Orania macrocladus* Mart. "Ebol." A noble palm about 40 feet tall. Rare in Singapore. Some trees at Choa Chu Kang. More abundant in Pulau Ubin.

*Nipa fruticans* Wurmb. "Nipah." Common in tidal mud, all round Singapore. I have found fruits of this in the swampy ground of the Botanic Gardens near Cluny road, showing that the Bukit Timah stream was formerly tidal and salt as far inland as this.

*Phoenix* sp. A few plants of a wild date occur scattered about round Singapore, at Toas and elsewhere, but I have never been able to get fruits or flowers.

*Liesella ferruginea* Becc. "Palas." A stem-less palm with orange colored flowers and pink fruits. Common in jungle, Garden jungle, Bukit Timah, Choa Chu Kang.

*L. triphylla* Griff. A very pretty dwarf species, local, thick woods, Changi.

*L. spinosa* Wurmb. Woods, Pulau Ubin.

*L. acutifida* Mart. "Singapore Lobb"; evidently an error for Penang.

*Liristona Kingiana* Becc. A tall palm about 40 feet or more with large fan shaped leaves. Dense woods, Choa Chu Kang, Toas, Kranji.

*Calamus*. The Rotans so extensively exported from Singapore belong to the genera *Calamus*, *Davallorops*, *Korthalsia*, *Ceratolobus* and *Myrialepis*. They inhabit dense forests climbing to the tops of trees by the aid of their thorny flagella or whips. These flagella are used to protect fruit-trees from bats, the natives attaching them to the branches and bunches of fruits in such a way that the bats tear their wings when they fly to the tree.

- C. jacensis* Bl. "Rotan Lilin." A fine slender rattan, Kranji, Bukit Timah.
- C. diffusus* Becc. "Singapore Lobb." I know nothing of this.
- C. Singaporensis* Becc. Forest near the Botanic Garden, Merton. A very imperfectly known plant. I do not know it, and can find nothing like it there now.
- C. pallidulus* Becc. Rare, Jalan Bray.
- C. Ocegarni* Teysm. Rare, Toas.
- C. imignis* Griff. Bukit Timah.
- C. densiflorus* Becc. Bukit Mandai.
- C. Lobbiana*\* Becc. A short-stemmed species, with dark green leaves with white backs, and curious black fruits. Bukit Timah, Selitar.
- C. n. sp. near radulosus*. Garden jungle, Bukit Mandai.
- Daemonorops graniticus* Mart. "Rotan Sumambu." Common, Garden jungle, Bukit Timah, Selitar.
- D. hygrophilus* Mart. "Rotan Sepat." Chua Chu Kang, Chan Chu Kang.
- D. angustifolius* Mart. Garden jungle, Changi, Selitar.
- D. intermedius* Mart. Garden jungle, Bukit Timah.
- D. propinquus* Becc. "Rotan Bakau." Kranji, Bukit Arang, Ang Mo Kio, Bukit Mandai.
- D. didymophyllus* Becc. Common, Bukit Timah, Changi, Toas, Selitar.
- D. leptopus* Mart. Bukit Timah, Selitar.
- D. hystrix* Mart. "Rotan Sabut." Very common, Garden jungle, Bukit Timah, Selitar.
- D. geniculatus* Mart. Bukit Timah, Toas.

- D. longipes* Mart. Chan Chu Kang, Bukit Timah, Mandai Changi.
- D. cochleatus* Teysm. Rare, Selitar.
- D. crinita* Bl. Not rare, but I have never seen flowers or fruits.  
"Rotan Chinchin," Bukit Timah, Chan Chu Kang.
- D. aciculans* Bl. Chan Chu Kang.
- Zalacca conferta* Griff. "Asam Payoh." "Kelubi." A very thorny palm, common in water in jungles, forming close thickets, fruit very acid, sold and eaten by Malays. Clu-ny road, Chan Chu Kang, Bukit Mandai.
- Z. Wallichiana* Mart. Dryer woods. Bukit Timah, Bukit Mandai.
- Korthalsia echinometra* Becc. Climber with very large swollen sheaths inhabited by ants. Flowers and fruits unknown. Rare, Bukit Timah.
- K. scaphigera* Mart. "Rotan Semut." Common, Garden jungle, Bukit Timah. A good rattan.
- K. flagellaris* Miq. Bukit Mandai, Chan Chu Kang.
- K. polystachys* Mart. Bukit Timah.
- Ceratobas Kingianus* Becc. Bukit Timah, Selitar.
- Plectocomia Griffithii* Becc. "Rotan Dahan." A very large stout rattan. The flowers produced in an enormous inflorescence of pendulous spikes 8 feet long with close dark brown sheaths enclosing the flowers, each plant is unisex-ual, and the flowering stems die away after flowering. Common in all the woods.
- Myrialepis Scortechnii* Becc. "Rotan Kertong." Bukit Mandai, Selitar, Kranji.
- The Sago palms *Metroxylon Sagus* Rottb, and *M. Ruaphii* Mart., the "Lontar," *Borassus flabellifer* L., and the Coconut, *Cocos Nucifera* L. are cultivated here.

## AEOIDÆ.

*Cryptocoryne cinnata* Fisch. Very abundant in tidal mud. Flowers very rarely produced, Kranji, etc.

*C. Griffithii* Schott. Aquatic in streams in the forests often almost blocking them. Spathes submerged up to the mouth, tube white, limb dark crimson pubescent. Fruits pink. Common, Tanglin, Garden Road, Bukit Timah, Toa Payoh, Kranji, Chon Chu Kang.

*Pistia stratiotes* L. "Kiamban." The Water lettuce, is cultivated by the Chinese to feed pigs. Common in ditches.

*Typhonium Roxburghii* Schott. A weed in waste ground.

*Amorphophallus Prainii* Hook. fl. Bukit Timah.

*A. sp.* Leaf only seen. Reservoir, Bukit Timah.

*Colocasia antiquorum* L. "Kelali," and *Alocasia macrorrhiza* Schott and *A. indica* Schott are commonly cultivated, and occur as garden escapes. *A. cucullata* Schott occurs in waste ground in Tanglin, also doubtless introduced.

*Alocasia denudata* Engl. "Ketadi Riman." With hastate leaves deep green with paler nerves entire and peltate in seedlings, stem mottled with olive, is common in woods and banks all over Singapore.

*A. longiloba* Miq. "Singapore Wallich," is probably erroneously localised.

*Agyttonema nitidum* N. E. Br. with stems 1 to 2 feet tall and narrow deep green leaves at the top, is very common in dense woods. Bukit Timah, Chan Chu Kang, Changi, Pulau Ubin.

*A. oblongifolium* Schott. A stout plant with dark green leaves flecked with white. Common in swamps in the jungle. Chan Chu Kang, Bukit Mandai, Changi, Loyang.

*A. minus* Hook. fl. A dwarf species, leaves often mottled with paler color, or pale or dark green. Common in wet jun-

- gles. Garden Road, Kranji, Chua Chu Kang, Bukit Mandai, Bukit Timah.
- Homalomena sagittifolia* Jungh. "Kelenoyiang." Dense swampy jungle, Selitar, Changi, Bukit Timah.
- H. coralescens* Jungh. Common in jungles, hedges and banks. Tanglin, Changi, Bukit Timah, Kranji, Selitar.
- H. paludosa* Hook. fl. Wet swampy woods. Common, Kranji, Bukit Timah, Toas, Ang Mo Kio, Jurong.
- H. pumila* Hook. fl. A small plant leaves deep velvety green or purple according to locality. Common in woods, and very variable. Bukit Timah, Selitar, Reservoir woods.
- H. Griffithii* Hook. fl. Common in thick jungle, Bukit Timah, Bukit Mandai, Tanjong Gol, Selitar.
- H. Kingii* Hook. fl. Singapore, swamps (King). Not seen.
- H. oreata* Hook. fl. Singapore (Wallich). Not seen.
- H. singaporense* Regel. An altogether doubtful plant, cultivated in Russia.
- Schismatoglossum Wallichii* Hook. fl. Dense jungle in ravines abundant. Bukit Timah, Chua Chu Kang.
- S. longipes* Miq. Leaves ovate cordate dark green with a light green bar running round the centre. Abundant, rocky ravines. Bukit Timah.
- Analeumadrum montanum* Schott. Climbing on trees low down. Common, Garden jungle, Bukit Timah.
- A. medium* Schott. *Pothos bifolia* Wall. *Pothos caudicatus* of Gardens. The young plant grows flat on trees and rocks with close set distichous velvety green leaves and has long been cultivated under the last name in Europe. This form gradually passes into the adult which has stalked lobed and perforate leaves like those of *Mousteria*. Not rare, Bukit Timah, Jurong, Bidadari, Reservoir woods.
- Scindapsus pictus* Hassk. A well known ornamental climber with green leaves mottled with silver. Common in woods.

but rarely to be met with in flower. Bukit Timah, Chan Chu Kang.

*Se. hederacea* Schott. Climber. Common thick woods, Bukit Timah, Sungei Baluh, Sungei Tengeh, Chua Chu Kang, Bidadari.

*Raphidophora Lobbii* Schott. Woods, Bukit Timah.

*R. minor* Hook. f. Rare, Toas.

*R. gracilipes* Hook. f. ? Rare, Chan Chu Kang.

*Epipremnum gigantum* Schott. A strong creeper, with very large leathery leaves on trees and stumps common, Chan Chu Kang, Bedoh, Sungei Blukang.

*Lorit heterophylla* Schott. Tidal mud, also inland on muddy stream banks. Chua Chu Kang.

*Cyrtosperma lasioides* Griff. Common in marshes. Tanglin, Jurong, Chan Chu Kang, Bukit Mandai.

*Pothos Curtisii* Hook. f. Climbing on trees, Bukit Mandai, Kranji.

(*Acorus Calamus* L. "Deringu" cultivated and occurring as an escape. It rarely flowers here, but I found it in flower in June 1899.)

#### LEMNACEÆ.

*Lemna perenneata* Hegelm. Ditches, Tanglin, Galang, etc.

*L. polyrhiza*. Ditches, Tanglin.

*L. sp. near L. trisulca* L. Galang.

*Wolffia arrhiza* Wimm. Ditches, Alexandra road.

#### TRIURIDÆ.

*Sciaphila affinis* Becc. A minute slender plant pink with violet fruits. Not rare, dense jungle among dead leaves. Bukit

Timah, Chan Chu Kang, Selitar. I doubt this being distinct from Blume's *Sc. tenella*.

#### NAIADACEÆ.

*Najas minor* All. Ditches, Gardens, often a perfect pest in the Gardens lake.

#### ERICCAULONEÆ.

*Eriocaulum sexangulare* L. Very common all over Singapore.

*E. truncatum* Ham. Damp sandy spots, common. Tanglin, Tamjenis, Bukit Timah, Chan Chu Kang.

#### CYPERACEÆ.

*Kyllinga cylindrica* Nees. Rare, sandy spots. Cathedral close.

*K. melanosperma* Nees. Rare, in long damp grass. Tanglin.

*K. brevifolia* Rottb. Very common, whole island.

*K. monocephala* Rottb. Whole island.

*Pycreus nitens* Nees. Rare, damp sandy spots, Selitar, Changi.

*P. polystachys* Beauv. Very common, waste ground and open spots. var. *laxiflorus*. Marshy ground.

*Cyperus Haspan* L. Very common in marshy spots. Whole island.

*C. diffusus* Vahl. Sandy woods, Bukit Timah.

*C. radians* Nees. Sea shores, Changi.

*C. compressus* L. Common in waste ground, whole island.

*C. Iria* L. Weed of cultivation, whole island.

*C. distans* L. Very common in waste ground.

*C. Malaccensis* Lam. Muddy spots by tidal rivers, Balestier plain.

*C. pinnatus* Vahl. Wet or damp spots, whole island.

- C. bancanus* Miq. Cantley's collection, no locality.
- C. Zollingeri* Steud. Common, waste ground near villages.
- C. rotundus* L. Very common weed, gardens and waste ground.
- C. stoloniferus* Retz. Sea sand, Tanjong Ru, Changi.
- Mariscus Dregeanus* Kth. Common sandy places near the sea. Tanjong Katong, Balestier plain, Changi.
- M. Cyperinus* Vahl. Very common in dry spots, all over Singapore.
- M. Sieberianus* Nees. Waste ground, Tanglin, Galang.
- M. albescens* Gaud. Common near the sea. Tanjong Ru, Rochore, Bajau.
- M. microcephalus* Presl. Galang.
- Eleocharis variegata*, var. *baciflora* C.B.C. Very common in ponds and marshes, Tanglin, Reservoir, Blakang Mati, Changi.
- E. ochrostachys* Steud. Not rare, Garden Lake, Changi, Selitar, Tivoli.
- E. capitata* Br. Local, Changi, Tampons, Teban.
- E. chaeturia* Roem. Common in ditches, Tanglin, Chasserau Estate, Selitar.
- E. fistulosa* Schultes. Local. Marshes round the reservoir.
- Fimbristylis tetragona* Br. Balestier plain.
- Fimbristylis acuminata* Vahl. Common, Blakang Mati, Bukit Timah, Changi.
- F. setacea* Benth. Rare, Tanglin.
- F. nutans* Vahl. Damp sandy spots, Bukit Timah, Changi, Bukit Mandai, Blakang Mati.
- F. pauciflora* Br. Common all over Singapore in turf, and in damp spots.
- F. diphylla* Vahl. Very common all over Singapore.

*F. pluviostriata*. Long wet grass. Bukit Timah, Chan Chu Kang.

*F. aestivalis* Vahl. Damp cultivated ground, Tanglin.

*F. ferruginea* Vahl. Tidal river mud. Kranji, Chan Chu Kang, Pulau Ubin.

*F. spathacea* Roth. Sandy spots near the sea, common. Selitar, Bukit Mandai, Kranji, Changi.

*F. tenera* var. *obtusata*. Sandy spots and in turf, not rare. Tanglin, Jurong, Bukit Timah, Chua Chu Kang.

*F. asperima* Boeck. Woods, Bukit Mandai.

*F. mitinnea* Vahl. Very common in dry spots all over Singapore.

*F. glomerata* Kth. Common. Tanglin.

*F. complanata* Link. Not very common. Botanic Gardeus. Chan Chu Kang, Balestier plain.

*F. leptostada* Benth. Common in sandy spots. Tanglin, Bukit Timah, Changi, Balestier plain.

*Bulbostylis barbata* Kunth. Common every where in sandy spots.

*B. puberula* Kth. In Cantley's collection, without locality.

*Scirpus mucronatus* L. Common in pools and ditches, Reservoir, Chan Chu Kang.

*Sc. grossus* Lin. fil. Rare. Ditch at Wayang Satu, Bukit Timah Road.

*Fuirena umbellata* Rottb. Common in swampy spots.

*Lipocarpha argentea* R. Br. Common in wet spots all over the island.

*L. microcephala* Kth. Local. Bukit Mandai, and on the Bukit Timah road near Kranji, Galang.

*Rhynchospora Wallichiana* Kth. Common in dry heathy spots. Jurong, Sungai Morai, Selitar.

*R. mitis* C. B. C. Rare, Belok, Bukit Mandai.

*R. aurea* Vahl. Common in wet spots all over the island.

*R. glauca* var. *chinesis*. Rare. Sandy spots usually near the sea. Blakang Mati, Changi.

*Schoenus catostachys* Poir. Rare. Sandy spots, Changi.

*Cleistium glomeratum* Br. Damp sandy spots, Changi.

*Gahnia tristis* Nees. Common, Blakang Mati, Bukit Timah, Sungai Morai, Tanglin.

*Remirea meriti* Aubl. Sea shores, local, Changi, Tanah Merah.

*Hypolytrum latifolium* Rich. Woods, Jurong, Chan Chu Kang.

*H. prolifernum* Boeck. Damp spots, Tanglin, Chan Chu Kang.

*Thraupostachyum bancanum* Kurz. Very common in all jungles.

*Mopania patens* Benth. Dense woods, common, Bukit Timah, Chan Chu Kang.

*M. longa* C. B. C. In streams in jungle, rare, Chan Chu Kang.

*M. multispicata* C. B. C. Jungles, Bukit Timah.

*M. humilis* Naves. Jungles, common, Chan Chu Kang, Bukit Timah, Kranji, Bajau.

*Scirpocephalum costatum* Kurz. "Silensing." Common in tidal woods, forming large clumps of long grassy leaves, among which the flower panicles are concealed. The fruit is an inch long and is probably the largest in the order. Bukit Mandai, Jurong, Changi, Selitar.

*Lepironia mucronata* Rich. Swamps, Teban, Jurong.

*Setaria rufula* Hance. Bukit Timah, Bedoh.

*Set. Ridleyi* Clarke. Rare, Changi. It also occurs in Pulau Buru near the Carimon Isles and Hongkong.

*Set. biflora* Roxb. Damp spots and turf. Blakang Mati, Bukit Timah, Changi, Tanglin.

*Set. zeylanica* Poir. Wet spots, Changi, Tanglin.

*Set. caricina* Benth. Very common, paths and tufts, and damp spots. All over Singapore.

*Set. lateriflora* Beckler. Kalang, Tanglin.

*Set. oryzoides* Presl. Rare, wet spots, Changi.

*Set. bancana* Miq. Common in open country, Tanglin, etc.

*Set. multifoliata* Boeck. Not uncommon in woods. Bukit Timah, Garden jungle.

*Set. sumatrensis* Retz. Very common in open country all over the island.

*Set. tenuis* Retz. Common in dry open spots and waste ground. Whole island.

*Carex cyathostachys* Brongn. Local, in a stream on Bukit Timah.

#### GRAMINEAE.

*Paspalum scrobiculatum* L. Common everywhere.

*P. conjugatum* Berg. Very common, probably introduced.

*P. distichum* Burm. Plentiful in salt mud all round the island, Tanjong Ru, Bajau.

*P. sanguinale* Lam. Common everywhere in waste ground.

*P. longiflorum* Retz. Common in waste ground.

*Leucanea Kurthiana* Wt. Wet places in woods. Bukit Mandai, Chan Chu Kang, Jurong.

*L. australis* R. Br. Very common in marshes, Tanglin, etc.

*L. miliacea* Roth. Wet spots in woods, Tanglin, Bukit Timah Road 6th mile, Selitar.

*Panicum crusgalli* L. Rare, collected by Hullett without locality.

*P. colonum* L. Common in waste ground.

- P. distachyos* L. Not Common, Bukit Mandai, Changi, Tanglin.
- P. repens* L. Common, Tanglin, Reservoir, Changi.
- P. auritum* Presl. Wet, open spots, Reservoir, Changi, Ang Mo Kio.
- P. indicum* L. Common, waste ground.
- P. myosuroides* Br. Ditches, Ang Mo Kio, Kranji.
- P. nodosus* Kth. Hedges and thickets, Tanglin, Chan Chu Kang.
- P. ovalifolium* Poir. Rare, Government Hill.
- P. sarmentosum* Roxb. Woods, Grange Road, Changi, Sumbawang.
- P. luzonense* Presl. Dry roadsides and waste ground, Tanglin, Galang.
- P. patens* L. Shady spots, Tanglin, Bukit Timah, Chua Chu Kang.
- P. pilipes* Nees. Roadsides, Bukit Timah, Gardens, etc.
- P. latifolium* L. Damp, shady spots, Tanglin.
- Axonopus ciamicinus* Beauv. Waste ground, Tanglin, Chan Chu Kang.
- Setaria glauca* Beauv. Waste ground, common. Tanglin, Ang Mo Kio, Chua Chu Kang.
- Thurea sarmentosa* Po s. Sandy places near the sea, local. Changi, Galang, Teluk Kurau.
- Leersia hexandra* Sw. Common in marshes, whole island.
- Leptaspis ureolata* R. Br. Dense woods, Bukit Timah, Changi, Chan Chu Kang.
- Perotis latifolia* Ait. Sandy places, Cathedral compound, Galang, Changi.
- Zoysia pungens* Willd. Common in turf and near the sea.

*Coxa Lachryma-Jobi* L. "Job's Tears," "Jilei." Occurs in waste ground.)

*Dimeria ornithopoda* Trin. Dry sandy spots, Tanglin, Bukit Timah road. Var. *Subrimosa* sub. var. *imperfecta* Hackel. Changi.

*Imperata arundinacea* Cyrill. "Lalang." Probably the commonest plant in the island.

*I. exaltata* Bragn. "Lalang Jawa." Common, usually near abandoned villages, Selitar, Bajau, Chua Chu Kang.

*Ischaemum rufosum* Salisb. Rare, Galang.

*I. magnum* Rendle. Blakang Mati, Balestier plain, Galang. I have also collected it in Labuan.

*I. mucronatum* L. Common everywhere.

*I. ciliaté* Retz. Roadsides, and turf. Very common.

*I. timorensis* Kth. Roadsides, Tanglin, Kranji.

*Rottboellia glaucescens* Trin. Borders of woods and thickets, Changi, Bajau, Pulau Ubin.

*Andropogon pseudograssy* Kth. Sandy places. Galang, Changi, Blakang Mati.

*A. aciculatus* Retz. Very common in turf, etc., everywhere.

*A. contortus* L. Sandy spots near the sea, Changi.

*Anthistiri carpiens* Willd. Dry open spots. Chinese cemetery, Sepoy lines.

*A. gigantea* var. *villosa*. A very tall reedlike-grass. Dry spots. Fort Siloso, Siglap, Balestier plain.

*Polytrias promissa* Hack. Grassy spots. Tanglin, Chasserian Estate.

*Sphaerocaryum elegans* Ners. Wet paths in jungle common, Kranji, Ang Mo Kio.

*Sporobolus indicus* L. Mt. Faber, Ang Mo Kio, Tanglin, Galang.

*Eriachne pallens* Br. Dry sandy spots. Blakang Mati, Ganglang.

*Cynodon dactylon* Pers. Common in dry spots.

*Chloris barbata* Sw. Pulau Brani (introduced) Passir Panjang

*Eleusine indica* L. Very common in waste ground. The cultivated variety *coracina* is also sometimes to be met with.

*E. aegyptiacus* Desv. Local, Rochore, Changi.

*Eragrostis tenella* R. and S. Very common in waste ground.

*E. amabilis* Wight. Very common.

*E. elegantula* Steud. Chasseriau Estate.

*E. elongata* Jacq. Dry spots, Tanglin, Changi, Bukit Timah, Chasseriau Estate.

*Centotheca lappacea* Beauv. Common in woods. Garden jungle, Bukit Timah, etc.

*Lophatherum Lehmanni* Brugu. Woods. Garden jungle, Selitar, etc.

*Bambusa Ridleyi* Gamble.\* A very slender bamboo growing in dense woods, Bukit Timah.

(*Dendrocalamus flagellifer* Munro. Cultivated for its edible shoots. Jurong, Tanglin.)

*Schizostachyum Blumei* Nees. Perhaps introduced from Java, Roadsides, Selitar, Bukit Timah Road.

(*Gigantochloa verticillata* Munro. Cultivated, Tanglin, Bukit Timah Road.)

*Ochlandra Ridleyi* Gamble.\* "Buluh Kasap." Bukit Mandai, Choa Chu Kang. The Javanese say this is introduced from Java, but it is not known elsewhere than Singapore.

#### FILICES.

In this list of the ferns, I have followed Beddome's Ferns of British India.

*Gleichenia linearis* Burm. *GL. dichotoma* Willd. "Resam," common all over Singapore.

*Asplenium Litobrosa* Hook. Tree fern, stem about 5 feet tall and 2 inches through. Common in damp woods. Bukit Timah, Jurong, Chan Chu Kang, Bukit Mandai, Choa Chu Kang.

*A. comosa* Hook. Not rare, Bukit Timah, Jurong, Selitar, Chan Chu Kang.

*A. Rüdigi* Bak. Rare, Sungei Morai.

*Lecanopteris carnosa* Bl. Very rare, on lofty trees, Bukit Timah.

*Hymenophyllum polyanthos*. Common on trees and rocks in thick woods. Bukit Timah, Kranji, Changi, Bajau, Sungei Morai.

*H. denticulatum* Sw. Not common, mangroves, Kranji.

*H. Neesii* Hook. Selitar, Bukit Timah.

*H.* sp. Bukit Mandai (8938).

*Trichomanes murcoiles* Sw. Rocks, Bukit Timah.

*Tr. Javanicum* Bl. Terrestrial, very common in all damp woods.

*Tr. rigidum* Sw. Less common, Bukit Timah, Toas, Kranji, Sungei Morai, Selitar, Tanjong Merawan.

*Tr. filicula* Bory. *Tr. bipinnatum* Poir. Creeping on rocks and trees, not very common, Bukit Timah, Chan Chu Kang, Kranji.

*Tr. maximum* Bl. Rare, Bajau.

*Tr. digitatum* Sw. Rare, Kranji.

*Tr. parviflorum* Poir. "Singapore, Moore's Herbarium" file Beddoe; not seen.

*Humata heterophylla* Sw. On trees and on the ground in sandy spots. Common, Changi, Bajau, Tampines, Kranji, Bukit Timah.

*H. angustata* Wall. On trees, Sungai Morai, Chan Chu Kang.

*H. pedata* Sw. Not common, Kranji, Bajau.

*H. parallela* Wall. Tanjong Merawan.

*H. sessilifolia* Bl. "Singapore, Sinclair and Moore's Herbarium" in Beddome: not seen.

*Leucostegia parvula* Wall. Mangrove swamps. Kranji, Sungai Buluh, Tanjong Merawan.

*Prosopitia contigua* Sw. "Singapore" sive Beddome, must be very doubtful.

*Dacallia triphylla* Hook. On lofty trees, apparently by no means rare, but difficult to produce. Bukit Timah, Selitar, Kranji.

*D. solida* Sw. Common, Selitar, Chua Chu Kang, Sungai Merai.

*D. elegans* Sw. On trees, often very high, and on the sand of the shores, Bukit Timah, Changi.

*Microlepia speluncarum* L. Common on banks, Tanglin, Ang Mo Kio, Changi, Pasir Panjang, Rochore.

*Lindsays repens* Thw. Climbing on small trees in thick forest, Bukit Timah.

*L. trapeziformis* Dry. *L. Lancea* (L). Dense forest, Bukit Timah Selitar.

*L. borneensis* Hook. Jurong.

*L. rigidula* Sm. Rare, Sungai Buluh.

*L. Wallichae* Hook. In open wet spots, common, but local, Changi, Tampenis, Bukit Mandai.

*L. divergens* Wall. Common in dry woods, Bukit Timah, Bajau, Sungai Morai.

*L. liruginosa* Wall. On trees, Jurong river, Bajau, on trees in the Botanic Gardens.

*Schizoloma lobata* Poir. In dense woods, Bukit Timah.

*Sch. ensifolii* Sw. In thick wet woods, Chua Chu Kang.

*Sch. media* R. Br. Rare, Pulau Brani.

*Sch. heterophylla* Dry. Rare, Pulau Brani.

*Adiantum flabellulatum* L. Banks, Changi; Rocks, Pulau Ubin.  
A few other species have established themselves as garden  
escapes.

*Chei'anthes tenuifolia* Sw. Common in dry spots, Tanglin, Chan  
Chu Kang, Pulau Ubin.

*Pteris ensiformis* Burm. Common in dry spots, Bukit Timah,  
Tanglin, Pulau Ubin.

*Pt. longifolia* L. Mount Pleasant, (Hullett).

*Pt. aquilina* L. Common all over Singapore.

*Litobrochia incisa* Thunb. Tanglin (probably an escape).

*Ceratopteris thalictroides* L. Common in ditches and sluggish  
streams. Tanglin, Selitar, Changi.

*Blechnum orientale* L. Very common in open places, Tanglin,  
Bukit Timah, etc.

*B. Finlaysonianum* Wall. In similar localities, Reservoir, Bukit  
Timah, Chan Chu Kang.

*B. serratum* Rch. Singapore (Hullett).

*Thamnopteris nuda* L. Common on trees all over Singapore, the  
large form var. *musaefolia* is the commonest form.

*Athyrium squamulatum* Bl. Much resembles the last, but has a  
creeping stem. Wet woods, usually growing on stumps,  
Bukit Timah, Chua Chu Kang.

*A. longissimum* Bl. On roots of Bamboos, Tanglin.

*A. tenerum* Forst. Woods, common, Garden jungle, Bukit Timah,  
Ang Mo Kio.

*A. ja'catum* Lam. Rare, woods, Bukit Timah.

*A. macrophyllum* Sw. Not common, Chan Chu Kang, Sungai Buluh, Pulau Ubin (Kunstler).

*Diplazium pallidum* Bl. Toas.

*D. porrectum* Wall. Common in woods, Reservoir, Holland Road, Chan Chu Kang, Bukit Timah, Changi.

*D. bantamense* Bl. Singapore (Hullett).

*D. sylvaticum* Presl. Singapore (Hullett).

*D. speciosissimum* Mett. Wood near Holland road, Serangoon Road, Bukit Timah.

*D. tomentosum* Hook. Woods, Bukit Timah.

*D. sorzogonense* Presl. Bukit Timah.

*Anisognathum cordifolium* Mett. Rocks, Bukit Timah.

*Aspidium Singaporianum* Wall. Woods, common, Bukit Timah, Chua Chu Kang.

*A. eastum* Bl. Woods, Bukit Timah, Pulau Ubin.

*A. cicutarium* Sw. Common in woods, Sungai Blukang, Bukit Timah, Pulau Ubin.

*A. semibipinnatum*. Bukit Timah, Bajau, Bukit Mandai.

*A. Zollingerianum* Kze. Bukit Timah.

*Pleocnemia gigantea* Bl. Bukit Timah.

*Lastrea crassifolia* Bl. Bukit Timah, Bajan, Bukit Mandai

*L. fuscipes* Wall. Bukit Timah.

*L. appendiculata*. Chua Chu Kang.

*Nephrodium unitum* L. Common in open places, Galang, Selitar.

*N. eucalyptum* Bl. Common, Sepoy lines, Jurong, Changi.

*N. aridum* Don. Jurong, Green Hill, Kranji.

*N. urophyllum* Wall. Dense jungle, Bukit Timah.

*N. mollis* Desv. Common in open places, Tanglin, Chua Chu Kang, Selitar, Pulau Brani.

Var. *ambonense*. Green Hill, etc.

Var. *procurrens*. Green Hill.

Var. *didymosorum*. Not rare.

*N. pennigerum* Bl. Chan Chu Kang.

*N. tectum* Wall. Singapore (Wallich); not seen.

*N. heterocarpum* Bl. Green Hill (Hullett).

*N. polycarpum* Bl. *Mesochlora polycarpa* Bl. Woods, Bukit Timah.

*N. latibracteatum* Kze. Bukit Timah.

*N. tricuspidatum* Presl. Singapore (Hullett).

*Nephrolepis exaltata* L. Common in open country all over Singapore.

*N. colubrina* J. Sm. Climbing over bushes, Rochore, Toas, Sungei Morai.

*N. acuta* Presl. Singapore (Hullett.)

*N. Duffii*. Has established itself at Changi and a few other places.

*Dictyopteris Barberi* Hook. Bukit Timah.

*D. difformis* Bl. Bukit Timah.

*Polypodium decorum* Brack. Common on trees, mangrove swamps, Kranji, Sungei Buluh, Toas.

*P. streptophyllum* Bak. Very rare. Trees on Serangoon Road (Murton).

*P. adpersum* Bl. and *P. setigerum* Bl. in Moore's Herbarium (Beddome), probably wrongly localised.

*Goniophlebium verrucosum* Wall. Damp open spots, Bukit Mandai, Pasir Panjang.

*Niphobolus adnascens* Sw. On trees, Changi, Pulau Ubin.

*N. acrostichoides* Sw. Garden jungle, Chan Chu Kang.

*N. penangianus* Hook. Rare, Kranji.

*Dipteris Horfiellii* Br. Abundant on rocks and banks overhanging the sea, all round the island from Pasir Panjang to Changi, also on Pulau Tekong and other islands in the Strait.

*Drymaria Lianaei* Bory. On trees, Changi, Serangoor, Toas.

*D. quercifolium* L. On trees, Toas.

*D. splendens* Hook. Singapore (Beddome).

*Pleopeltis stenophylla* Bl. On lofty trees, Bukit Timah.

*P. sinuosa* Wall. Common on trees. This curious fern is remarkable for its hollow rhizome always full of ant's nests. Gardens, Jurong, Bukit Timah.

*P. longifolia* Mett. Sungei Morai.

*P. angustata* Sw. Common on trees, Gardens, Sungei Morai, Changi, Bajau, Serangoon.

*P. punctata* L. *P. irivoides* Hook. Common on trees and banks, Tanglin, Siglap, Sungei Buloh, Chan Chu Kang.

*P. phymatodes* L. Very common on trees on the ground in dry spots. Tanglin, Bukit Timah, Selitar, Changi.

*P. nigrescens* Bl. Woods, Bukit Timah.

*Monogramme trichoides* Sm. A very small hair-like fern, rocks, Bukit Timah.

*Syngramme Wachtii* Hook. Woods, common, Bukit Timah, Selitar, Chan Chu Kang, etc.

*S. alismatifolia* Hook. Less common, Bukit Timah, Chan Chu Kang.

*Selaginella* Peei Hook. Common on trees; especially mangroves Kranji, Bajau, etc.

*S. membranacea* Hook. "Singapore, Moore's Herb." (Beddome.)

*Gymnoogramme calamelana*. The silver fern occurs here and there as an escape. Tanglin, Chan Chu Kang.

*Meniscium triphyllum* Sw. Banks of streams, Toa Payoh.

*M. cuspidatum* Bl. Upper Mandai, Bukit Timah, Chua Chu Kang.

*Antrophyum reticulatum* Kaulf. On trees and rocks, not common, Bukit Timah.

*A. plantagineum* Kaulf. Selitar.

*Vittaria elongata* Sw. Very common on trees, Gardens, Kranji, Thompson Road, etc.

*V. scolopendrina* Presl. On trees. Chua Chu Kang.

*Taenites blechnoides* Willd. Very common in woods all over Singapore.

*Drymoglossum piloselloides* Presl. Common on trees everywhere.

*Elatoglossum litifolium* Sw. On trees in mangrove swamps. Kranji.

*Stenochlaena palustre* L. Common, climbing over trees and bushes. The young creeping form with delicate finely cut fronds may be found in wet woods. I found a curious fasciated form on Bukit Timah. Rochore, Tanglin, Bukit Timah, etc.

*Polybotrya appendiculata* Willd. Local. Rocks, Bukit Timah.

*Gymnopteris subrepanda* Hook. Bukit Timah.

*G. Presiana* Hook. Bukit Timah (Hullet).

*Acrostichum aureum* L. Common in tidal mud, on all the rivers.

*Platycerium grande* Sm. Not seen. Singapore (Beddome).

- Pt. biforme* Bl. Common in trees all over Singapore.
- Schizaea dichotoma* Sw. Dry woods, common all over Singapore.
- Sch. digitatum* Sw. Dry woods. Common all over Singapore.
- Lycopodium microphyllum* B. Br. Common in open places, thickets, etc. Tanglin, Changi, Kranji.
- L. circinatum* Sw. *L. dichotomum* Bedd. "Kil-u-Ribu." Very abundant, climbing over trees and bushes, whole island.
- L. flexuosum* L. Singapore, Hollett.
- Angiopteris erecta* Hoffm. Rocky woods, Bukit Timah.
- Ophinglossum undiculae* L. Bukit Panjang, Chan Chu Kang.
- O pendulum* L. Epiphytic on *Thamnopteris* and *Platycerium*. Not common, Tanglin.

## LYCOPODIACEAE.

- Lycopodium cernuum* L. Terrestrial. Common all over Singapore, in open country and secondary growth.
- L. tarifolium* Sw. Epiphytic on mangroves and other trees near the sea. Sungei Sumbawang, Chan Chu Kang.
- L. phlegmaria* L. Epiphytic, Garden jungle, Chan Chu Kang.
- L. squarrosum* Forst. Epiphytic. Tanjong Merawan.
- L. nummularifolium* Bl. Epiphytic, Chan Chu Kang.
- Setaginella atroriridis* Spring. Common in woods, Garden jungle, Changi, Bukit Timah, Chua Chu Kang.
- S. plumosa* Bak. Plentiful in many spots in damp woods, Bukit Timah, Jurong.
- S. Willdenowii* Bak. Common climbing in thickets. Bukit Timah, Bukit Mandai, Kranji, etc.
- S. trichobasis* Bak. "Singapore, Sir W. Norris," file Baker; perhaps an error for Penang, where Sir W. Norris collected plants. I have not seen it in Singapore.

*S.* sp. Small plant, Bukit Timah, No. 6547.

*Pelotum flaccidum* Wall. On trees in mangrove swamps, Kranji

*P. complanatum* Sw. Mangroves, Sungai Morai, Kranji.

RHIZOCARPEAE.

*Azolla pinnata* R. Br. A small floating plant. Ditches, common, Tanglin, Ang Mo Kio, Galang.

Addenda.

*Ludwigia parviflora* Roxb. Ditch.s, Tanglin.

*Euryale angustipetala* Ridl. Common in ponds and ditches, Tanglin. This new genus must be put in place of *Hydrilla verticillata*, for which it was mistaken.

## Chinese Names of Streets in Penang,

By LO MAN YUK.

*Communicated by the Secretary.*

In making this little compilation, the compiler has followed the example set before him by the late Mr. H. T. Haughton who published a list of street names of Singapore Town with their Chinese equivalents in the Journal of the Straits Branch of the Royal Asiatic Society in the June issue of 1891. The present compilation may be taken as a fairly complete list of the names of roads, streets and lanes in George Town with their respective Chinese names as called by the Hokkiens and Cantonese, two of the more important sections of the Chinese community in Penang, as well as with notes explaining the meaning and giving the derivation of the Chinese names. From a glance at these explanatory notes, it will be observed that the Chinese call their streets generally after some prominent buildings or objects of view, or the nationality of the people residing, or the particular kind of business carried on, in the locality. There are, however, some new and out-of-the-way places which have no Chinese names but which are inserted here partly for the purpose of making the list as complete as possible and partly for the purpose of leaving space for the insertion of any Chinese names that may be evolved in future. To this little compilation are appended (1) a list of some notable buildings and places in George Town (2) a list of some district names in town and up-country, (3) a list of the names of some islets in the vicinity of Penang and (4) a list of names of some places in Province Wellesley and Dindings; all with their Chinese equivalents. In conclusion, the compiler desires to express his best thanks to Mr. Cheam Cheow Heng, the Senior Chinese Interpreter of the Police Courts, and other friends for much valuable information concerning this compilation.

**Acheen Street:** (1) *Hokkien*, Koāi<sup>1</sup> laū-á 高樓仔 "a small high tower," the high tower is the four-storied corner house at the junction of Acheen Street and Beach Street. *Cantonese*, Ko lau chai 高樓仔 (2) *Hokkien*, Phah chiōh ke 打石街 "striking stone street;" so called from the stone-cutters' shop there. *Cantonese*, Ta-shek kai 打石街

**Acheen Street Ghaut:** (1) *Hokkien*, Koāi<sup>1</sup>-laū-á lō-thau 高樓仔路頭 *Cantonese*, Ko-lau-chai lo-thau 高樓仔路頭 (2) *Hokkien*, Phah-chiōh-ke lō-thau 打石街路頭 lō-thau means landing-place. *Cantonese*, Ta-shek-kai lo-thau, 打石街路頭

**Ah Quee Street:** *Hokkien*, A kui ke 亞貴街 called after Captain Ah Quee who presented it to the Municipality. *Cantonese*, A Kwai kai 亞貴街

**Argus Lane:** *Hokkien*, Sek län ni (Serani) lē-pai-tiōg aū hāng-á 色蘭乳禮拜堂後巷仔 "Serani Church back lane" = the lane behind the Church of Assumption.

**Argyle Road:** *Hokkien*, Bang-ka-li hāng 望葛里巷 "Bengali lane;" so called because there used to be many, and there are still some, Bengalis living there. *Cantonese*, Mang-ka-li hong 孟加里巷

**Armenian Street:** PART I., between Beach Street and Pitt Street. (1) *Hokkien*, Pún-thaū-kong bāng 本頭公巷 "gods' lane;" so called after the Kong-si house

of the Toā Peh Kong 大伯公 otherwise known as the Kièn Tek 建德 secret society, where they kept their gods; the remains of that Kong-si house may still be seen at the junction of Armenian Street and Pitt Street. *Cantonese*, Tai-pak-kung-hong 大伯公巷 "gods' lane." (2) *Hokkien*, Kièn goān ke 建元街; Kièn is evidently taken from the name of the Kien Tek Kong-si referred to in (1). Goān means origin, and Ke street.

PART II., between Pitt Street and Acheen Street: *Hokkien*, Phah tāng ke 打銅街 "striking copper street," from the Malay braziers' shops there. *Cantonese*, Ta thung kai 打銅街

**Armenian Street Ghaut:** *Hokkien*, Pún-thaú-kong-hāng lō-thau 本頭公巷路頭 *Cantonese*, Tai-pak-kung-hong lo-thau. 大伯公巷路頭

**Ayer Itam Road:** *Hokkien*, A-iá i-tám (Ayer Itam) lō 亞也依淡路; lō means road. *Cantonese*, Ayer Itam lo 亞逸依淡路

**Bagan Jermal Road:** *Hokkien*, Oán-tó-ló· 澹斗路 Oán-ló· means the bay.

**Barrack Road:** *Hokkien*, Peng jāng lō 兵房路 "soldier barrack road." *Cantonese*, Peng fong lo 兵房路

**Beach Street:** PART I., between Light Street and China Street. *Hokkien*, Thó-khò (thaú-khò) ke 土庫街

"godown street;" street where the European firms are.  
*Cantonese*, Tho-fu kai 土庫街

PART II., between China Street and Chulia Street.  
*Hokkien*, Kang-á-khaú 港仔口 "harbour entrance"; in olden times, before the reclamation of the ghauts, the shipping business was principally done in this part of Beach Street by the Chinese. *Cantonese*, Kong-chai hau 港仔口

PART III., between Chulia Street and Armenian Street.  
*Hokkien*, Tiong ke 中街 "middle street," i. e., the middle part of Beach Street. *Cantonese*, Chung Kai 中街

PART IV., between Armenian Street and Acheen Street.  
*Hokkien*, Toan ló-sin 緞羅申. *Cantonese*, Tuan lo-san 緞羅申 Ló-sin is Hussain, i.e., Tungku Syed Hussain, who formerly owned most of the houses in this part of Beach Street.

PART V., between Acheen Street and Malay Street. *Hokkien*, Phah thih ke 打鐵街 "striking iron street," from the blacksmiths' shops there. *Cantonese*, Ta-thit ka 打鐵街

PART VI. between Malay Street and Prangin Ditch. *Hokkien* Siā bōe 社尾 "village end"; formerly this was practically the end of the town. *Cantonese*, She mi 社尾 Those parts of Prangin Road and Bridge Street which join Beach Street at the Anson Bridge are sometimes, though improperly, called Siā-bōe; the general name for the whole district round about here is Ujong Pasar, meaning end of town.

PARTS IV., V. and VI. are often called Fuk Kin kai 福建街 "Hokkien Street" by the *Cantonese*, because most of the shopkeepers there are *Hokkiens*.

**Bishop Street:** PART I., between Beach Street and Penang Street. (1) *Hokkien*, Chhat bok ke 漆木街 "painting wood street," from the furniture makers' shops there. *Cantonese*, Chhat muk kai (2) *Hokkien*, Chha kang ke 漆木街 "wood workmen street."

PART II., between Penang Street and King Street. *Hokkien*, Lü-sòng ló-pai-tiū chéng 呂宋禮拜堂前 "Armenian Church front," Lü-sòng being a corruption of Luzon of the Philippine Islands. *Cantonese*, Lu-sung lai-pai-thong Cbbin 呂宋禮拜堂前

PART III., between King Street and Pitt Street. *Hokkien*, Sün-tek Kong-si ke 順德公司街 called after the Kong-si house of the Sün Tek people. *Cantonese*, Shun Tak Kong-si kai 順德公司街

**Brick-Kiln Road:** *Hokkien*, Hong chhia lō 風車路 "wind carriage road"; "wind carriage" is the Switchback Railway. *Cantonese*, Fung Chihe lo 風車路

**Bridge Street:** PART I., Beach Street end. *Hokkien*, Koe káng-á 過港仔 "passed rivulet," the other side of the Prangin Ditch. *Cantonese*, Kwo kong chai 過港仔

PART II., the middle part. *Hokkien*, Pang lóng廊枋 "plank depot." *Cantonese*, Pan Čhboug 廊枋

PART III. Jelutong Road end, *Hokkien*, Sēng-hóng biō lō. 城隍廟路 "Seng Ong Temple Street," called after the

Temple of the tutelary God of the town. *Cantonese*, Shing Wong miu lo 城隍廟路

**Buckingham Street** : *Hokkien*, Siu-ke thaū 新街頭 "Campbell Street head." *Cantonese*, San-ke thaū 新街頭

**Burmah Road** : *Hokkien*, Gù chhia chui 牛車水 (often contracted to Chhia chui, "bullock-cart water"); before the construction of the Municipal Water Service, water sellers used to come to a well here for water and convey the same in bullock carts to town for sale. *Cantonese*, Ngau Chhe Shui 牛車水

**Campbell Street** : (1) *Hokkien*, Sinke 新街 "new street," in contradistinction to Chulia Street, the old street where all the Chinese brothels were before Campbell Street was constructed. *Cantonese*, San kai 新街 (2) *Hokkien*, Sin tōa-mui-lau 新大門樓 "new Chulia Street" (see Chulia Street). *Cantonese*, San tai mun lau 新大門樓 (3) *Cantonese*, Kam-le tai kai 金利大街 Kam-le being the Cantonese pronunciation of Campbell, and tai kai meaning big street. This last name is chiefly used in matters of marriage, funeral and joss processions.

**Cannon Square** : *Hokkien*, Lióng San Tōng lāi 龍山堂內 "Liong San Tong inside"; Lióng San Tōng is the Chop of the Seh Khu Kong-si 姓邱公司 which is inside this square. *Cantonese*, Shing Yau Kung-si; the Kong-si house of the surname Yau clan.

**Cannon Street:** *Hokkien*, Toā Chhèng Khang  
**大銃空** "big cannon hole," so called because during the  
 Penang Riots the Government fired a cannon shot into this place  
 where the people of the Toā Peh Kong 大伯公 otherwise  
 known as the Kièn Tek 建德 Kong-si encamped.

**Carnarvon Street:** PART I., between Chulia Street and  
 Campbell Street, *Hokkien*, Toā-mūr-lau hoái ke 大門樓  
**橫街** "Chulia Street, Cross Street"—the street branching  
 off from Chulia Street. *Cantonese*, Tai-mun-lau wáng kāi  
**大門樓橫街**

PART II., between Campbell Street and the Station,  
*Hokkien*, Hoan-si thióng 番仔塚 "foreigners' cemetery"  
 the old Malay cemetery. *Cantonese*, Ma-lai fāu 馬塚墳

PART III., between Acheen Street and Prangin Road.  
 (1) *Hokkien*, Lam Chhán-á 脊田仔 "poor fields"—swamp;  
 it was formerly nothing but a swamp. *Cantonese*, Chho thong  
**草塘** "grass pond"—swamp. (2) *Hokkien*, Si-kak Chi<sup>2</sup> 四  
 角井 "square well"; formerly there was a square well near  
 the junction of Kimberley Street. (3) *Hokkien*, Cháp-keng  
 chhù 十間厝 "ten houses"; formerly there was a row of  
 ten houses of the same height there. (4) *Hokkien*, Si<sup>2</sup> Tiu<sup>2</sup>  
 Kong-si ke 姓張公司街 called after the Kong-si house  
 of the seh Tiu clan. *Cantonese*, Shing Chung Kong-si kai  
**姓張公司街**

**Carnarvon Lane:** *Hokkien*, Kam-kong lai 鑑先內

"Kampong inside," within the Kampong (or village) so called because formerly there was a Kampong in this locality. *Cantonese*, Kam-pong lai 金榜內

**Cecil Street:** *Hokkien*, Kòe Káng-á tē chhit tian lō 過港仔第七條路 "passed rivulet, number seven street" i. e. the seventh street after crossing the Prangin Ditch from Beach Street. *Cantonese*, Kwo kong chai tai ch'at thiu lo 過港仔第七條路

**Che Em Lane:** *Hokkien*, Pak Kan lai 北間內 "pak kan inside"; pak kan is the Chinese pronunciation of the Malay word pekan, a village.

**China Street:** *Hokkien*, Toā ke 大街 "big street," i. e., the principal street where the Chinese formerly carried on business. *Cantonese*, Kun-yam-miu-chek-kai 觀音廟直街 "Kun Yam Temple straight street." The street going straight from the Temple of the Goddess of Mercy.

**China Street Ghaut:** (1) *Hokkien*, Toā-ke lō-thau 大街路頭 *Cantonese*, Kun-yam-miu-chek-kai lo-thau 觀音廟直街路頭 (2) *Hokkien*, Bēng san lō-thau 明山路頭

Bēng san, Mr. Khoo Bēng San, a Chinese merchant, had a shop there.

**Chowrasta Road:** *Hokkien*, Kiet-léng-á lān-san 吉寧仔萬山 "Kling market," i. e., the Chowrasta market, where the fish and meat sellers are principally Klings; the word Bān-san being a corruption for the Malay word Bangsal. (Tamil-street has the same name.) *Cantonese*, Kit-léng pá-sat

**吉寧巴虱** "Kling market," pā-sat being a corruption of the Malay word pasar.

**Chulia Street:** PART I., between Beach Street and Pitt Street. (1) *Hokkien*, kiet-léng-á-ke 吉寧仔街 "Kling Street," so called from the Kling shop-keepers there. The word Chulia itself is a Bengali word meaning Kling. (Vide King street PART IV). *Cantonese*, kit-ling kai 吉寧街 (2) *Hokkien*, ló-lin-ke 羅鄰街 Lò-lin is the Chinese pronunciation for Noordin and ke means street, so called after the business premises of Mr. H. M. Noordin. *Cantonese*, Yi sheung kai 衣箱街 "clothes box street," from the Chinese cabinet-makers' shops there.

PART II., between Pitt Street and Love Lane. *Hokkien* Toā möi<sup>n</sup> laū 大門樓 "big archway"; formerly there were two big archways to a large compound house here (see Sek Chuen Lane). *Cantonese*, Tai mun lau 大門樓

PART III., between Love Lane and Penang Road. *Hokkien* gù-kan-tàng 牛干冬 "cattle pen"; gù means cattle and kan-tàng is the Chinese pronunciation for the Malay word "kan-dang" meaning a pen. *Cantonese*, Sha kong thou 砂岡頭 "sand hill head," in former days people used to deposit rubbish there which heaped up in a mound.

**Chulia Street Ghaut:** (1) *Hokkien*, kiet-léng-á-ke ló-thau 吉寧仔街路頭 (vide Chulia Street, PART I.) *Cantonese*, kit-ling-kai lo-thau 吉寧街路頭 (2) *Hokkien*, Si<sup>n</sup> Iū-Kong-si ke 姓楊公司街 called after the Kong-si house of

the Seh Iu clan. *Cantonese*, Shing Yeung Kong-si kai 姓楊  
公司街 (3) *Hokkien*, Chhà lō-thaú 柴路頭 "firewood  
landing-place"; firewood used to be sold there, before Maxwell  
Road, now a principal place for selling firewood, was constructed.  
(4) *Hokkien*, Toā chūi chi 大水井 "big water well"; for-  
merly there was a big water tank there (*vide* Pitt street  
PART III).

**Chulia Lane:** *Hokkien*, Cháp-chhit keng 十七間  
"Seventeen houses" there was a row of seventeen houses of the  
same size there. *Cantonese*, Shap-chhat kan 十七間

**Church Street:** *Hokkien*, Gi-hin ke 義興街 "Gi-hin  
street" after the Kong-si house of the GI hin secret society,  
which stood where now the family residence of Captain Ah Quee  
is. *Cantonese*, Yi hing kai 義興街

**Church Street Ghaut:** (1) *Hokkien*, Gi-hin-ke lō-  
thaú 義興街路頭 *Cantonese*, Yi-hing kai lo-than 義興街  
路頭 (2) *Hokkien*, Chiū lō-thaú 酒廊路頭 "distillery land-  
ing-place"; the distillery stands at the junction of Church  
Street and Beach Street and belongs to the Spirit Farm.

**Cintra Street:** (1) *Hokkien*, Sin-ke hoai' ke 新街  
橫街 "Campbell Street, Cross Street"—the street crossing  
Campbell Street. *Cantonese*, San kai wang kai 新街橫街  
(2) *Hokkien*, Phah phau ke 打炮街 the street where brothels  
of the lowest type are. *Cantonese*, Ta Phan Kai 打炮街  
That part of this street which runs between Chulia Street and  
Campbell Street is often called Jit-puin ke 日本街 meaning  
Japanese Street—the street where the Japanese brothels are.  
*Cantonese*, Yat pun chai kai 日本寨街 "Japanese brothel  
street."

**Dato Kramat Road:** PART I., between Magazine Station and Dato Kramat Station. *Hokkien*, Kam-á hū<sup>an</sup> **柑仔園** "orange plantation"; formerly there was a big orange plantation there. *Cantonese*, Kam chai iün **柑仔園**

PART II., between Dato Kramat Station and the Prisons. *Hokkien*, Si-kham tiäm **四坎店** "four shops"; there were only four shops there before. *Cantonese*, Si kan tim **四間店**

**Downing Street:** (1) *Hokkien*, Goñ koan **外關** "outer Government office" = Chinese Protectorate, which stands in this street. *Cantonese*, Man wa kun **問話館** "asking question house"; house where female immigrants from China are examined = Chinese Protectorate. (2) *Hokkien*, Tai jin koan **大人關** "the Taijin's office" = the Chinese Protectorate. *Cantonese*, Phai kun **牌館** "license-house" i.e., the house where licences under the Contagious Disease Ordinance were issued = Chinese Protectorate.

**Drury Lane:** *Hokkien*, Sin hi-tái **新戲臺** "new theatre" after the new Chinese theatre there. *Cantonese*, san hi-iün **新戲園**

**Esplanade Road:** *Hokkien*, Chhau-po· haf-ki<sup>an</sup> lō<sup>an</sup> **草埔海墘路** "grass field seaside road" = road at the sea-side of the Esplanade. *Cantonese*, Ta po· te hoi phe **打波地海皮** "striking ball place sea-side." (2) Sin kau chheung hoi phe **小較場海皮** small parade ground sea-side."

**Farquhar Street:** PART I., between Pitt Street and Love Lane. *Hokkien*, áng mó· óh chéng **紅毛學前** "red hair school front," the front of the Penang Free School.

PART II., between Love Lane and Leith Street. (1) *Hokkien*, Lién hoa hō· 蓮花湖 "lotus pond," so called after a big lotus pond formerly situated at the side of the St. George's Girl School, the pond having been filled up some years ago on account of the many accidents to people in attempting to get at the lotus. (2) *Hokkien*, sek-lün-ni (serani) bō chéng 色蘭乳學前 "serani school front."

PART III., between Leith Street and Northam Road. *Hokkien*, ang mó· lō· 紅毛路 "red hair road" the road where Europeans live. (Northam Road has the same name.)

**Fish Lane:** *Hokkien*, kiám hú·á hāng 鹽魚仔港 "salt-fish lane," because it branches off from Prangin Lane, which is called the 'Salt-fish yard.' *Cantonese*, ham u hong 鹽魚港

**Gladstone Road:** *Hokkien*, hoé chhia lō· 火車路 "fire carriage road"; the fire carriage is the Tramway. *Cantonese* Fo chhe lo 火車路

**Green Hall:** (1) *Hokkien*, toān pái-lí 緞巴尼 Mr Paddy (Pali) formerly owned a large portion of land here. (2) *Hokkien*, ki-lin hō· 麒麟虎 a corruption for Green Hall.

**Heriot Street:** *Hokkien*, kōe káng-á tō pēh tiāu lō· 過港仔第八條路 "passed rivulet, number eight street;" i.e. the eighth street after crossing the Prangin Ditch from Beach Street. *Cantonese*, kwo kong chai tai pat thiū lo 過港仔第八條路

**Hong Kong Street:** *Hokkien*, Hiang káng lō· 香港路 hiang káng is the Hokkien pronunciation of Hongkong.

*Cantonese*, Heung kong kai 香港街 heung kong is the Cantonese pronunciation of Hongkong, and kai means street. (The word Hong itself is a mispronunciation of heung originating from the boat-population of Canton who were the first to come in contact with Europeans when they appeared in China).

**Hospital Road:** *Hokkien*, Pr<sup>er</sup> chhū lō<sup>r</sup> 病厝路 "sick house road" = road leading to the General Hospital. *Cantonese*, Wong ka yi im lo 王家醫院路

**Hutton Lane:** *Hokkien*, Gia-jän (jalan) a-téng 惹蘭亞丁 a-teng is the Chinese pronunciation for Hutton.

**Jelutong Road:** *Hokkien*, Jit-lōh-tōng lō<sup>r</sup> 日落洞路 jit-lōh-tōng is the Chinese pronunciation for Jelutong. The town end of this road is called ē-tōng 下洞 or hē-tōng 下洞 which means the lower tōng, and the country end of this road is called téng-tōng 頂洞 or siāng-tōng 上洞 which means the upper tōng, i. e., cave. *Cantonese*, Yat lok tong.

**Katz Street:** *Hokkien*, Koè káng-á tē lák tiāu lō<sup>r</sup> 過港第六條路 "passed rivulet, number six street," i. e., the sixth street after crossing the Prangin Ditch from Beach Street. *Cantonese*, Kwo kong chai tai luk thiū lo 過港仔第六條路

**Kedah Road:** *Hokkien*, Kám kóng mā lák kah 鑑光麻六甲 "Kampong Malacca." *Cantonese*, Ku phai kün 舊牌館 "old license house"; this referring to the Lock Hospital, which was formerly situated at the site where the present Chowrasta Dispensary is.

**Keng Kwee Street:** *Hokkien*, Kéng kái ke 景貴街 named after Captain Ah Quee, who built this street and connected it with Penang Road. *Cantonese*, Keng kwai kai 景貴街

**Kimberley Street:** (1) *Hokkien*, Tio-chiu ke 潮洲街 Te chiu is the name of a prefecture in the Quang-tung Province in South China, better known as Chao-chow-fu 潮洲府 from which the Te-chiu people come. This street is so called because formerly there were many China-born Te-chiu prostitutes living there. Owing, however, to the prohibition of female emigration from Swatow, which is the sea-port of Chao-chow-fu, by the Chinese Government upon representations being made by the Te-chiu merchants in the Straits Settlements, all Te-chiu prostitutes have since disappeared from this street. *Cantonese*, Chiu chau mui kai 潮洲殊街 "chiu chau girl street," (2) *Hokkien*, Soa'-thaú ke 汕頭街 "Swatow street." (3) *Hokkien*, Mi' soá' ke 麵線街 "vermicelli street," so called after the vermicelli makers there. (4) *Hokkien*, Si' Ti' kong-si ke 姓鄭公司街 after the Kong-si house of the seh Ti' clan, which was formerly in this street. (5) *Hokkien*, Phah soh-i häng 打索仔巷 "striking rope street" formerly there were some rope makers' shops there. (Rope Walk is sometimes called by this name a'so.)

**King Street:** PART I., between Light Street and Bishop Street. *Hokkien*, Kai-keng-chhù an 九間厝後 "Penang Street back" (i.e. Penang Street, Part I.)

PART II., between Bishop Street and China Street. (1)

*Hokkien*, Kui-tang-toā peh kong ke 廣東大伯公街 Kui-tang is the *Hokkien* pronunciation of Quang-tung, a province in South China. Toā peh kong means god, so called because there is a temple there built by subscriptions raised solely from the *Cantonese*. *Cantonese*, Kwong-tung tai pak kung kai 廣東大伯公街 (2) *Hokkien*, A-phieu kong-si ke 亞片公司街 "Opium farm street," so called after the Opium and Spirit Farms at the junction of China Street. *Cantonese*, In kung-si 煙公司

PART III., between China Street and Market Street.  
*Hokkien*, Ku Hö-seng kong-si ke 舊和勝公司街 Hö-seng is the name of a secret society, which formerly had its Kong-st house there. *Cantonese*, Kau wo shing kung-si kai 舊和勝公司街

PART IV., between Market Street and Chulia Street.  
*Hokkien*, Kiet-iēng-á ke 咕寧仔街 "Kling Street"; this part of King Street was formerly inhabited chiefly by Klings (*vide* Chulia Street, Part I.) *Cantonese*, Pak kap lung 伯鴻籠 "Pigeon hole," so called because formerly there were some exceedingly small houses there occupied as brothels.

**Kulim Lane:** (1) *Hokkien*, Bān an tài 萬安臺 "Bān an theatre," so called after the name of the Chinese theatre in this lane. *Cantonese*, Mau on thoi 萬安臺 (2) *Hokkien*, Bēng hū-tái 明戲臺 "Bēng's theatre"; bēng is a part of the name of Mr. Ong Bēng Tek, the former proprietor of the theatre.

**Kuala Kangsa Road:** *Hokkien*, Hoan-á hi-hūi ke 番仔戲園街 "foreigners' theatre," so called from the Malay theatre there.

*Cantonese*, Ma-jai hiün kai 嘴盡戲園街 "Malay theatre street."

**Leith Street:** *Hokkien*, Siang ho chhù chéng 相好厝前 "Siang ho's house front."

**Light Street:** *Hokkien*, Po lē khau 玻璃口 "Police mouth" entrance to the Police Courts. *Cantonese*, Po-le-si chhiu 玻璃士前 "Police front."

**Love Lane:** *Hokkien* Sek-lan-ni (Serani) hāng 色蘭巷 Eurasian lane, this lane was formerly inhabited chiefly by Eurasians.

*Cantonese*, PART I., between Farquhar Street and Muntri Street; Shap-tsz-ka lai-pai-thong pin 十字架禮拜堂邊 "Cross Church side"; the church referred to is the church of Assumption.

PART II., between Muntri Street and Chulia Street. (1) Ma shui hau 手水喉 "double water pipe," formerly there were two public stand-pipes there standing side by side. (2) Lo pau miu kai 魯班廟街 "lo pau temple street" the street where the Temple of the God of Carpentry is. This lane is sometimes called lat-le hong by the Cantonese, lat-le being a mispronunciation for Love Lane and hong meaning lane.

**MacAlister Road:** *Hokkien*, Tiong lo 中路 "middle road," i.e., the middle road of the six roads meeting at Magazine *Cantonese*, Chung lo 中路

**MacCallum Street:** *Hokkien*, Kòe káng-á tē gōr tiau lo

**過港仔第五條路** "passed rivulet, number five street" i.e., the fifth street after crossing the Prangin Ditch from Beach Street. *Cantonese*, Kwo kong chai san lo 過港仔第五

**Magazine** (the open space formed by the intersection of the six roads in front of the Magazine Police Station). (1) *Hokkien*, Chhèng iōh keng 銃藥間 "gun-powder depot" formerly the Government gun-powder magazine was there. *Cantonese*, Fo yeuk kuk 火藥局 (2) *Hokkien*, Gō· pha teng 五枝燈 "the five lamps" referring to the Municipal lamp-post which holds five lamps. *Cantonese*, Ng chan tang 五盞燈 (3) *Hokkien*, Lák chhē lō 六叉路 "the intersection of six roads" viz., Magazine Road, Gladstone Road, Penang Road, MacAlister Road, Dato Kramat Road and Brick-kiln Road. The Malay version of this name is Simpang Anam. *Cantonese*, Luk a lo 六叉路

**Magazine Road:** *Hokkien*, Kòe káng-á tē it (or thaū) tiaū lō 過港仔第一條路 "passed rivulet, number one street," i.e., the first street after crossing Prangin Ditch from Beach Street. *Cantonese*, Kwo kong chai tai yat thiu lo 過港仔第一條路

**Malay Street:** *Hokkien*: Thái gù hāng 割牛巷 "killing cows lane," cattle were formerly slaughtered there for the market. It is also called Thái gù aū 割牛巷 the back of the place where cows were killed. *Cantonese*, Thong ngau hong.

**Malay Street Ghaut:** *Hokkien*, Thái gù hāng lō-thaū

創牛巷路頭 *Cantonese*, Thong-ngau-hong lo thau 創牛  
巷頭

**Market Lane:** *Hokkien*, Kóng hok kū hāng 廣福居巷  
kóng hok kū is the Chinese name of the Penang Mutual Improvement Association the premises of which are in of this lane. *Cantonese*, Yi-nai hong 二奶巷 “concubine lane,” so called because this lane used to be occupied chiefly by kept women.

**Market Street:** *Hokkien*, Pá-sat ke 巴虱街 pá sat is a corruption for pasar, a Malay word meaning market. *Cantonese* Pa-sat kai 巴虱街

**Market Street Ghaut:** *Hokkien*, Sin bān-san 新峇  
山 “the new market,” i. e., the Central market. Bān-san is a corruption of the Malay “bangsal”, meaning a shed. *Cantonese*, San pat sā 新巴虱 “new pasar”

**Maxwell Road:** PART I., between Bridge Street and Gladstone Road. *Hokkien*, Chhā tiā 營埕 “firewood yard”; this is the principal place where firewood is sold in Penang.

PART II., between Gladstone Road and Penang Road. *Hokkien*, Khai Héng Bí bí-ka 開恒美米絞 “Chop Khie Heng Be’s rice mill. N. B. This road and Prangin Road are often called káng-á ki 港仔墘 “rivulet side” because of their proximity to the Prangin Ditch.

**Muda Lane:** *Hokkien*, Thái-ko hāng 癫哥巷 “leper’s lane”, many lepers used to live in this place on the charity of a certain wealthy Chinaman.

**Muntri Street:** (1) *Hokkien*, Sek-lán-ní hāng 色簾  
乳巷 Eurasian lane. (2) *Hokkien*, Lám hoa i-r ke 南華  
醫院街 "Lám hoa hospital street," after the Chinese medical  
institution there. *Cantonese*, Nam wa yi iin kai 南華醫院  
街 (3) *Hokkien*, Sin hái-lám kong-si ke 新海南公司街  
"new Hailam kong-si street," after the new Kong-si house of the  
Hailams. *Cantonese*, San hoi nam kung-si kai 新海南公司  
街

**Noordin Street:** *Hokkien*, Koè káng-á tē ji tiāu lō-  
過港仔第二條路 "passed rivulet, number two street"  
i. e., the second street after crossing the Prangin Ditch from  
Beach Street. *Cantonese* Kwo kong chai tai yi thiū lo 過港  
仔第二條路

**Northam Road:** *Hokkien*, Aīg mó̄ lō̄ 紅毛路 "red  
hair road"—road where the Europeans live. That part of this  
road which joins Penang Road is sometimes called áng mó̄ kū  
thióng 紅毛舊塚 "red [hair old cemetery]", i. e., the Pro-  
testant and Roman Catholic Cemetery there. *Cantonese*, Hung  
mo lo 紅毛路

**Penang Road:** PART I., about Chulia Street. *Hokkien*,  
Tiāu-lāng ke 吊人街 "hanging people street"—formerly cri-  
minals were hung there. *Cantonese*, Tiu yan kai 吊人街

PART II., about Chowrasta market. (1) *Hokkien*, Kū kha-  
ku 舊腳檻 "old jail"—the old Criminal Prison, which was  
formerly situated at the present vacant piece of ground opposite  
the Chowrasta market. *Cantonese*, Kau ka-ku 舊腳檻 (1)

*Hokkien*, Léng chiak chhù chéng 寧爵厝前 "Leng Cheak's house front."

PART III., about the Prangin Ditch. *Hokkien*, Tiaù kiò thanū 吊橋頭 "suspension bridge head," i. e., the bridge over the Prangin Ditch. This name is sometimes, though improperly, applied, to those parts of Prangin Road, Maxwell Road and Burmah Road which join Penang Road at the Prangin Ditch; the general name for the whole district round about here is Titi Papan, meaning wooden bridge. *Cantonese*, Tiu kiu thanū 吊橋頭

PART IV., about the Magazine Police Station. *Hokkien*, Láng chhia tèng jái koan 人車釘牌館 "rickshaw nailing licence office" — the rickshaw registration department.

**Penang Street:** PART I., between Light Street and Bishop Street. *Hokkien*, Kaú keng chhù 九間厝 "nine houses"; formerly there were only nine houses in this part of Penang Street on the right hand side as one goes up from Light Street.

PART II., between Bisep Street and Market Street. (1) *Hokkien*, Kúi-tang ke 廣東街 Kui-tang = Quang-tung Province in Southern China and ke = street; so called because this part of Penang Street is principally occupied by Cantonese shopkeepers. *Cantonese*, Kwong-tung kai 廣東街 kwong-tung = Quang tung Province; kai = street. (2) *Hokkien*, Má-káu ke 馬交街 "Macao Street"; *Cantonese*, Thong-yan kai 唐人街 "Chinamen's street"; the word Chinaman refers to the Cantonese in distinction from the Hokkiens, whom the former considered to be foreigners on account of their different provinciality.

PART III., between Market Street and Chulia Street  
*Hokkien*, Che-ti ke 齊知街 "chetty" street," from the chetty  
 money-lenders living there.

**Perak Road:** *Hokkien*, Toā lō·nū 大路後 "big  
 road back,"—behind the big road.

**Phee Choon Lane:** *Hokkien*, Phi Chün lō· 不俊路  
 Phee Choon is a part of the name of Mr. Li Phee Choon.

**Pitt Lane:** *Hokkien*, Tio-chiu kong-si au 潮洲公司後  
 "Te-chin Kong-si back," behind the Te-chin Kong-si house in  
 Chulia Street, where it joins Queen's Street. *Cantonese*, Chhiu  
 Chan Kung-si au 潮洲公司後

**Pitt Street:** PART I., between Light Street and China Street. *Hokkien*, Koan im téng chéng 觀音亭前 "Koan im  
 temple front," front of the temple of the Goddess of Mercy.  
 The Straits-born women often pronounce Klam or Kolam instead  
 of koan im, by way of contraction. *Cantonese*, Kun yam miu  
 chhin 觀音廟前

PART II., between China Street and Chulia Street. *Hokkien*,  
 Toā ba-lai 大峇晾 "big balei"; the Balei is the Pitt Street  
 Police Station. *Cantonese*, Tai mata liu 大孖打寮 "big  
 police house."

PART III., between Chulia Street and Armenian Street.  
*Hokkien*, Toā chui chi 大水井 "big water well"; formerly  
 there was a big water tank there. *Cantonese*, Tai mun lau kai-si  
 大門樓街市 "Chulia Street market." [Vide Chulia Street

Ghaut (4)] (2) *Hokkien*, lú kha 椰腳 "coco-nut foot"; there were many cocoa-nut trees there.

**Prangin Road:** PART I., between Beach Street and Carnarvon Street. (1) *Hokkien*, Oân tháu-á 灣頭仔 "the small turning," i. e., the turning from Beach Street. *Cantonese*, Wan thau chái 灣頭仔 (2) *Hokkien*, Hái Chiu Kong-si ke 惠洲公司街 "the street where the Kong-si house of the Hái Chiu people is. Hái Chiu is the name of a prefecture in South China whence the Khehs or Hakkas come. *Cantonese*, wai chau kung-si kai 惠洲公司街.

PART II., between Carnarvon Street and Sungei Ujong. *Hokkien*, Khai Héng Bí ke 開恒美街 the street where Chop Khie Heng Be (rice merchant) is. *Cantonese*, Hoi Hang Mi kai 開恒美街.

PART III., between Sungei Ujong and Penang Road. *Hokkien*, Gú chhia ke 牛車街 "bullock-cart street," from the bullock-cart builders' shops there. N. B. This road and Maxwell Road are often called Káng-a ki 港仔墘 "the rivulet side," because of their proximity to the Prangin Ditch. *Cantonese*, Ngau chhe kai 牛車街.

**Prangin Lane:** *Hokkien*, Kiám hú tiāu 鹽魚埕 "salt-fish yard," so called because salt-fish are dried and cured there, i. e., at the back part of the shops facing Prangin Road.

**Presgrave Street:** *Hokkien*, Koè káng-á tē sa" tiaú lō 過港仔第三條路 "passed rivulet, number three street,"

i. e., the third street after crossing the Prangin Ditch from Beach street. *Cantonese*, Kwo kong chai tai sam thiu lo 過港仔第三條路

**Queen Street:** (1) *Hokkien*, Chāp-jt keng 十二間 “twelve houses,” there is a row of twelve houses of the same height. *Cantonese*, Shap yi kan 十二間 (2) *Hokkien*, Kū Hō Háp siā ke 舊和合社街 “old Ho Hap society street,” called after the Kong-si because of this society there. *Cantonese*, Kan Wo Hap she kai 舊和合社街

**Race Course Road:** *Hokkien*, Toā chhái hūi lō 大菜園路 “big vegetable garden road,” from the many vegetable plantations there. *Cantonese*, Tai chhoi un 大菜園

**R. C. O. Front:** *Hokkien*, Koan-á kak 關仔角 “Government office corner”—the corner of the Government offices. *Cantonese*, Tai ma-thau 大馬頭 “big jetty,” after the Old Jetty there.

**Residency Road:** *Hokkien*, Jí óng chhái lō 二王厝路 “Second King's house road,” second King being the Chinese way of calling the Resident Councillor.

**Rope Walk:** (1) *Hokkien*, Gi-hok ke 義福街 “Gi hok street,” so called because the Gi hok secret society had their Kong-si house there formerly. *Cantonese*, Yi fuk kai 義福第 (2) *Hokkien*, Phah soh hāng 打索巷 “making rope lane”; formerly cocoanut husk ropes were manufactured there. [Vide Kimberley Street (5)]

**Sandilands Road:** *Hokkien*, Koè kóng-á tē kaú tiáu lō-  
過港仔第九條路 "passed rivulet, number. nine street,"  
i.e., the ninth street after crossing the Prangin Ditch from Beach  
Street. *Cantonese*, Kwō kóng chai tai kau thin lo- 過港仔  
第九條路

**Scotland Road:** *Hokkien*, Batu Gantong 峇抵眼東  
Malay, overhanging rock; there is a big overhanging rock there.

**Seh Tan Court:** *Hokkien*, Sī Tán kóng-si 姓陳公司  
after the Kong-si house of the Seh Tan clan. *Cantonese*, Shing  
chau Kung-si 姓陳公司

**Sek Chuan Lane:** *Hokkien*, Toā mūn̄ laū lai 大門樓內  
"big archway inside" = within the big archway; there was a big  
compound house there with two entrances, over each of which  
there was a big archway, the present Sek Chuan Lane being  
formerly one of the two entrances. (*Vide* Chulia Street, PART  
II.) *Cantonese*, tai mun Tau lung 大門樓龍

**Stewart Lane:** *Hokkien*, Koan im téng aū 觀音亭後  
"Koan im temple back" = behind the temple of the Goddess of  
Mercy. *Cantonese*, Kun yam miu han 觀音廟後

**Sungei Ujong:** (1) *Hokkien*, Hō̄ chio tiā 胡椒埕  
"Pepper yard," from the court-yard there where pepper is ex-  
posed to be dried. (2) *Hokkien*, Bân Tek Hong lō- 萬得豐路  
the road where chop Ban Tek Hong owns the pepper yard above  
referred to is situated. *Cantonese*, Man tak fung kai 萬得豐  
街

**Tamil Street:** *Hokkien*, Kiet-léng bān san 吉寧萬山 "Kling market." *Cantonese*, Kit-ling pa-sat 吉寧巴虱

**Tek Soon Street:** (1) *Hokkien*, Tek Sūn lō 德順路  
(2) *Hokkien*, Chhā tiān aū 柴埕後 "Maxwell Road back"  
(*Vide* Maxwell Road, Part I.)

**Thye Sin Street:** *Hokkien*, Koè káng-á tō sì tiāu lō  
過港仔第四條路 "passed rivulet, number four street,"  
i.e., the fourth street after crossing the Prangin Ditch from  
Beach street. *Cantonese*, Kwo kong chai tai si thin lo 過港仔第四條路

**Toa Aka Lane:** (1) *Hokkien*, Phah-thih-ke hāng-á  
打鐵街巷仔 "Beach street small lane," the lane that branches  
off from Beach street (*Vide* Beach street, Part V.). *Cantonese*, Ta-thit kai hong chai 打鐵街巷仔 (2) *Hokkien*, Kām-kóng-lai hoai lō 鑑光內橫路 "Carnarvon Lane cross  
street." *Cantonese*, Kam-póng loi wang kai 金榜內橫街

**Transfer Road:** *Hokkien*, Tek Sūn chhù pi" ke 德順厝邊街 "Tek Soon's house side street." *Cantonese*, Tak shun  
ok pin 德順屋邊

**Union Street:** *Hokkien*, Po-lé aū 玻璃後 "Police  
back" — behind the Police Courts. *Cantonese*, Po-li-si bau 玻璃司後

**Waterfall Road:** *Hokkien*, A ēk tò-lan 亞逸倒澗 the Chinese pronunciation for Ayer Terjun, which means 'water plunging.'

**Weld Quay:** *Hokkien*, Hai ki<sup>u</sup> sin lō<sup>u</sup> 海墘新路 'sea-beach new road,' or Sin hai ki<sup>u</sup> ke 新海墘街 "new sea-beach road." *Cantonese*, Hoi phe 海皮 "sea-beach."

**Western Road:** *Hokkien*, Ai<sup>u</sup> mō<sup>u</sup> sin thióng 紅毛斬塚 "red hair new cemetery," so called after the European new cemetery there. *Sai* *hoa* hāng 西華巷 the Western grand lane. Pēng an hāng 平安巷 the happy lane. *Cantonese*, San hung mo fan 新紅毛墳 "new red hair cemetery." *Sai* *wa* hong 西華巷 *Pheng* *on* *hong* 平安巷

#### GOVERNMENT OFFICES.

**R. C. O.** *Hokkien*, Jí öng koan 二王關 "No. 2 King's office"; the Governor being the No. 1 King.

**Treasury:** *Hokkien*, Kong-pān-gé khò-pàng 公班衙 庫房 *kong-pān-gé* is the Chinese pronunciation for company, i. e., the East India Company, the Government; and *khò-pàng* means treasury. *Cantonese*, Fu-fong 庫房 "treasury."

**Stamp Office:** (1) *Hokkien*, Bē ang-ú thaū è koan 賣兌仔頭之關 "Selling doll-head Office." *Cantonese*, Mai kung chai thaū nga mun 賣公仔頭衙門 "selling doll-head yamen." (2) *Hokkien*, si-tàn koan 寔担關 *si-tàn* = stamp, and *koan* means office. *Cantonese*, Si tam kun 土担館

**Public Works Department:** *Hokkien*, Niū tē koa<sup>a</sup>  
**量地官** "measuring land official." *Cantonese*, Leung te-kun  
**量地官**

**Land Office:** (1) *Hokkien*, Gā-lān koan 牙籤關 gá-lán  
 — grant. *Cantonese*, Thiu tho thien 田土廳 field land depart-  
 ment." (2) *Hokkien*, Tē chō· koan 地租關 "land rent office."

**Official Assignee's Office:** *Hokkien*, Pó kiōng si 報  
 窮司 "Reporting poverty Official." *Cantonese*, Po khung is  
**報窮司**

**Chinese Protectorate:** (1) *Hokkien*, Goā koan 外關  
 "Outer Office" — the office that transacts business with the general  
 public. *Cantonese*, Phai kuu 牌館 "Licence house" = house  
 where licences under the C. D. O. were issued. (2) *Hokkien*,  
 Tai-jin koan 大人關 Tai-jin literally means a great man, but  
 in Chinese official circles it is used as a title applying to any man-  
 darin of and above the rank of a Taotai, equivalent in English to  
 His or Your Excellency. *Cantonese*, Mau wa kūn 問話館  
 "asking questions house" = house where female immigrants from  
 China are examined under the Women and Girls' Protection  
 Ordinance. (3) *Hokkien*, Hō-üi si koan 護衛司關 "Protec-  
 ting Official's Office" office of the Protector (of Chinese). *Can-  
 tonese*, Tai yan nga mun 大人衙門 "Tai-jin's yamen. (4)  
*Hokkien*, Chèng bù si koan 政務司關 "the government  
 business official's office." *Cantonese*, U wai si nga mun 政務

**司衙門** "Protector's yamen". (5) *Cheng mo si nga mun* "government business official's yamen."

**Marine Department:** *Hokkien*, *Hai koan* 海關 "Harbour Office." *Cantonese*, *Hoi kwan* 信館

**General Post Office:** *Hokkien*, *Phe koan* 批關 "Letter Office." *Cantonese*, *Shun koan* 海關

**Supreme Court:** *Hokkien*, *Toā kōk* 大咯 "big court, kōk being the Chinese pronunciation for court. *Cantonese*, *Tai kol* 大葛 "big court."

**Solicitor General's Department:** *Hokkien*, *Kong-pān-gé chīg su* 公班衙狀師 *kong-pān-gé* = company, i.e., the East Indian Company, and *chīg su* means a lawyer. *Cantonese*, *Wong ka chong si* 王家狀師 "Government lawyer."

**Sheriff Department:** *Hokkien*, *Che-lip* 奢立 this is the Chinese pronunciation for Sheriff. *Cantonese*, *Fung pho ku* 封舖官 "sealing shop official." (2) *Hokkien*, *Hong chhū koa* 封厝官 "Sealing house official." (3) *Hokkien*, *Lē-long koa* 喇郎官 *Lelong* is a Malay-Portuguese word meaning auction, and *koa* means official.

**Police Courts:** *Hokkien*, *Po-lé* 玻璃 "police." *Cantonese*, *Pa-le-si* 玻璃司 "police."

**Coroner's Department:** *Hokkien*, *Giäm si koa* 驗屍官 "examining corpse official." *Cantonese*, *Im si kun* 驗屍官

**Police Superintendent's Office:** *Hokkien*, Goā po-lé-chú 外玻璃主 "outer police magistrate." *Cantonese*, Sau sham lau 新審樓

**Police Station:** (1) *Hokkien*, Má-tá<sup>+</sup> liú 馬打寮 "police house." *Cantonese*, Mata liu 馬打寮 (2) *Hokkien*, Ba lai 呆嚙 the Malay word balai, a station.

**Detective Police Station:** *Hokkien*, Ám-pái keng 暗牌間 "secret badge house"; detectives are called "secret badge," because they, not wearing any uniform, are supposed to wear a police badge secretly on their persons. *Cantonese*, Am phai kun 暗牌館

**Marine Police Station:** (1) *Hokkien*, Sún hái má-tá<sup>+</sup> liú 巡海馬打寮 "inspecting sea police house." *Cantonese*, Shui si mata liu 水師馬打寮 shui si means marine. (2) *Hokkien*, Sún hái ba lai 巡海峇嚙

**Criminal Prison:** *Hokkien*, Kha khu keng 脚櫃間 "foot-fettering house." *Cantonese*, Kam fong 監房 "confining house"

**Debtor's Prison:** *Hokkien*, Khiām chà kha klu keng 欠債脚櫃間 "Owing debts prison." *Cantonese*, Chhin thai kam 錢債監 "Debt prison."

**General Hospital:** *Hokkien*, Pi<sup>+</sup> chhù 痘厝 "Sick house." *Cantonese*, Yi shang kun 醫生館 (2) *Hokkien*, Ló<sup>+</sup> kun chhù 老君厝 "Doctor's house."

## MERCANTILE OFFICES.

**Chamber of Commerce:** *Hokkien*, Āng mō shing kong-si 紅毛商公司 "European merchants' Kong-si." *Cantonese*, Sai yan sheung mo kuk 西人商務局 "Western people's commercial business board."

**Hongkong & Shanghai Bank:** (1) *Hokkien*, Hui hong bang 匯豐<sup>望</sup> Hui hong being the Chinese chop of this bank and bang=bank. *Cantonese*, Uifung ngan hong 匯豐銀行 Uifung being the Chinese chop of this bank, and ngan hong means money firm-bank. (2) *Hokkien*, Siāng hai bang 上海<sup>望</sup> "Shanghai bank." *Cantonese*, Shung hoi ngan hong 上海銀行 "Shanghai bank."

**Chartered Bank:** *Hokkien*, Cha-ta bang 查達<sup>望</sup> "Chartered Bank." *Cantonese*, Cha-ta ngan hong 查打銀行 "Chartered Bank."

**Netherlands Trading Society:** *Hokkien*, Hö-lan bang 和蘭<sup>望</sup> "Holland bank." *Cantonese*, Ho-lan ngan hong 和蘭銀行

**Telegraph Office:** *Hokkien*, Phah tāng soh koan 打銅線關 "striking brass wire office." *Cantonese*, Tin po kok 電報局 "electricity report board."

**Tin Exchange:** (1) *Hokkien*, Chip siang só 集商所 "assembling merchant's place." *Cantonese*, Chap sheung so 集商所 (2) *Hokkien*, Siak Kong-si 錫公司 "the tin Kong-si." *Cantonese*, Shek kung-si 錫公司

**Opium and Spirit Farms:** (1) *Hokkien*, A-phièn kong-si 亞片公司 "opium Kong-si." *Cantonese*, Nga phin kong-si 亞片公司 (2) *Hokkien*, Chiū kong-si 酒公司 "Spirit kong-si." *Cantonese*, Chau kong-si 酒公司

**Municipal Office:** (1) *Hokkien*, Ah sè koan 押栖關 ah sè—the Malay word hasil, meaning tax, and koan means office. (2) *Hokkien*, Chiū sè koan 水栖關 "water rate office." (3) *Hokkien*, Kong pò kiòk 工部局 "works department."

**Town Hall:** *Hokkien*, Ang mó kong koán 紅毛公館 "European club."

**Chinese Town Hall:** *Hokkien*, Pēng cheung kong koán 平章公館 *Cantonese*: Pheng cheung kung kun 平章公館

**The Medical Institution:** *Hokkien*, Lám hoa i 球南華醫院 *Cantonese*, Nam wa-gi ün 南華醫院

**St. George's Church:** *Hokkien*, Ang mó toā lé-pái-tiğ 紅毛大禮拜堂 "European big church."

**Church of Assumption:** *Hokkien*, Sek-lân-ni lé-pái-tiğ 色蘭乳禮拜堂 "Eurasian Church."

**Armenian Church:** *Hokkien*, Lü-sòng lé-pái-tiğ 呂宋禮拜堂 lü sòng being a corruption for Luzon of the Philippines Islands, and lé-pái-tiğ means Church.

**Penang Free School:** *Hokkien*, Ang mó óh 紅毛學 "European school".

**St. Xavier's Institution:** *Hokkien*, Sek-lân-ni óh 色蘭乳學 "Eurasian School."

**St. George's Girls' School:** *Hokkien*, Lü ôh 女學  
"girls' school".

**Convent:** *Hokkien*, Ni ko am 尼姑庵 "nunnery."  
*Cantonese*, K u leung thong 姑娘堂 "ladies' house", the ladies  
being the nuns.

**Government Hill:** *Hokkien*, Seng ki soa\* 升旗山  
"Hoisting flag hill". *Cantonese*, Shing khi san 升旗山

**Dato Kramat Gardens:** *Hokkien*, Ong ke hoa hu\*  
王家花園 "Government gardens." *Cantonese*, Wong ke fa un  
王家花園

**Waterfall:** *Hokkien*, A-ek tò-lün 亞逸倒壘 "Ayer  
turjun" = water plunging. *Cantonese*, Shui mo 水磨

**Race Course:** *Hokkien*, Phau bé khoan 跑馬環 "run-  
ning horse field." *Cantonese*, Phau ma chheung 跑馬場

**Esplanade:** (1) *Hokkien*, Chhañ po 草埔 "grassfield."  
*Cantonese*, Siu kau chheung 小較場 "small parade ground."  
(2) *Hokkien*, Phah kiú po 打球埔 "striking ball field." *Cantonese*, Ta po te 打波地 "striking ball land."

**Fort Cornwallis:** *Hokkien*, Ang mó siá\* 紅毛城  
"European city." *Cantonese*, Phau thoí 炮臺 "fort."

**New Jetty:** (1) *Hokkien*, Thih ló-thau 鐵路頭  
"iron landing place." (2) *Hokkien*, Thih kió 鐵橋 "iron bridge."

**Old Jetty:** *Hokkien*, Koan-á kak patian 關仔角鵝岸  
koan á kak = R. C. O. front, and "patian" is a Malay word for jetty.

**Residency:** *Hokkien*, Jī ēng chhù 二王厝 "No. 2 King's house."

**Chinese Consulate:** *Hokkien*, Tai chheng kok lèng sū huí 大清國領事府 "The Great Pure Kingdom Consulate." *Cantonese*, Tai chheng kwok lèng si fu 大清國領事府

**The Temple of the Goddess of Mercy** (in Pitt Street):  
 (1) *Hokkien*, Koan im tēng 亭音觀 "Koan Im Temple." *Cantonese*, Kun yam miu 觀音廟 (2) *Hokkien*, Kóng hok kiōng 廣福宮 "Quang-tung and Fukien temple" — *Cantonese* and *Hokkien* temple. *Cantonese*, Kwong fuk kung 廣福宮

**The Temple of the God of the Town** (in Jelutong):  
*Hokkien*, Sēng ēng biō 城隍廟 the Seng Ong god is supposed to take his appointment from Yama, the ruler of hell, to whom he has to report the doings, good or evil, of the people in the town under his jurisdiction. The Chinese consider this temple to be the most appropriate one for taking oaths, such as that of cutting off cock's heads, etc. *Cantonese*, Shing wong miu 城隍廟

**The Temple of the God of Carpentry** (in Love Lane): *Hokkien*, Lò pān kò· biō 魯班古廟 "Lo pan's ancient temple." *Cantonese*, Lo pan ku miu 魯班古廟

**The Temple of the Three Precious Ones**—the Buddhist Trinity (in Ayer Itam): *Hokkien*, Kek lók si 極樂寺 "Supreme felicity monastery." *Cantonese*, Kek lok chi 極樂寺 (2) *Hokkien*, Sam pō tiēn 三寶殿 "the court of the Three Precious Ones," so called after the shrine of the Buddhist Trinity inside the above-mentioned monastery. *Cantonese*, Sam po tin 三寶殿

**The Temple of Philosopher Lao-tsu**, the founder of Taoism : *Cantonese*, Chibeng koan si 清觀寺 "clear view monastery." This temple is situated at the top of a hill in Paya Rubong, and is approached by a path consisting of a long flight of granite steps known as the Chheng jī chàn 千二層 the 1200 steps. *Cantonese*, Chheng kun chi 清觀寺

**The Temple of the Local Deities**: (1) *Hokkien*, Toā peh kong 大伯公 *Cantonese*, Tai pak kung 大伯公 (2) *Hokkien*, Pún thāu kong 本頭公 One in King Street, one in Tanjong Tokong, one in Ayer Itam, etc. *Cantonese*, Tho te kung 土地公

**The Pleasure Club** 燕閒別墅 (in Chulia Street) : *Hokkien*, Ièn hän piét so. *Cantonese*, In han pit sū.

**The Penang Literary Association** 以文齋 (near the Esplanade) : *Hokkien*, I bün chai. *Cantonese*, I man chai.

**The Chinese Club** 清芳閣 (in MacAlister Road) : *Hokkien*, Chheng hong kòk. *Cantonese*, Chhing fong kok.

**The Anglo-Chinese Reading Room** 萍雅軒 (in Chulia Street) : *Hokkien*, Chui nge hiēn 萍雅軒 *Cantonese*, Su nga hin 萍雅軒

#### CHINESE KONGSI-HOUSES.

A. HOKKIEN. (Names romanised in Hokkien sound.)

Sir Khu 邱 Kong-si Chop Liōng San Tōng 龍山堂 Cannon Square

" Khu 邱 " " Bün San Tōng 文山堂 Weld Quay.

Sir Lim 林	Kong-si Chop Kiú Lióng Tōng	九龍堂	Beach Street.
„ Tan 陳 „ „	Eung Chhoan Tōng	穎川堂	Seh Tan Court.
„ Lü 楊 „ „	Sù Ti Tōng	四知堂	Chulia St. Ghaut
„ Uí 黃 „ „	Chi lén Tōng	紫燕堂	Jelutong
„ Tiu 張 „ „	Chbeng Hó Tōng	清河堂	Carnarvon St.
„ Chiú 謝 „ „	Pó Sú Siá	寶樹社	Armenian St.
„ Ong 王 „ „	Thái Guán Tōng	太原堂	Penang Road.

## B. CANTONESE. (Names romanized in Cantonese sound.)

寧陽會館 Leng yeung ui kun; leng yeung is another name for san leng 新寧 and ui kun means meeting-house. (In King Street.)

會館 ui kun; ui stands for san ui 新會 and kun means house. (In Bishop Street.)

會寧館 Ui leng kun; here ui stands for si ui 四會 leng stands for kwong leng 廣寧 and kun means house. (In Muntri Street.)

香邑館 Heung yap kun; "heung town house." Heung stands for heung shan 香山 (In King Street).

**伍氏家廟** Ng shi ka miu ; " Surname Ng family temple,"  
(In King Street.)

**梁氏家廟** Leung shi ka miu ; " Surname Leung family temple." (In Mantri Street.)

**黃氏家塾** Wong shi ka shuk ; " Surname Wong family school." (In Penang Street.)

**李氏館** Li shi kun ; " Surname Li house." (In Love Lane.)

**端芬館** Tun fan kun ; the Kong-si house of the people of  
surname Miu. (In Penang Street.)

**古城會館** Ku shing ui kun, "The ancient city meeting  
house"; this is the meeting-house of the people of  
the following four surnames Lau 劉 Kwan 關  
Cheung 張 and Chiu 趙 The words ancient  
city' bear reference to the story of the "Three  
Kingdoms," in which four notables of the above  
surnames respectively adopted each other as  
brothers. (In King Street.)

**五福書院** Ng fuk shu un " the five blessings college"; this  
is the Kong-si house of the people coming from  
the following twelve districts of the Quang-tung  
(Canton) Province, viz., Nam Hoi 南海 Pun-u

潘禺 Tung kun 東莞 Shun tak 順德

Heung shan 香山 San on 新安 Sam shu

三水 Chhung fa 從化 Chang shang 增城

Ung mun 龍門 Chhing un 清遠 Fa un

花縣 (In Chulia street.)

C. TE-CHIU. Name romanized in Te-chiu sound.

**韓江家廟** Hang kang kia bio, "Han river family temple"; so called after the name of a river near Swatow in China.

D. KHEH or HAKKA. Names romanized in Kheh sound.

**嘉應會館** Ka in fi kwon ; ka in = ka ying chow, and fi kwon means meeting-house. (In King Street.)

**惠州會館** Fi chiu ti kwon ; fi chiu = Wai chow. (In Prangin Road.)

**增龍館** Chen liung kwon ; chen stands for chen shang 增城 and liung stands for liung mun 龍門 (In King street.)

**仁勝館** Yin shiu kwon. This is an old Kong-si house of the Kheh people. The name is simply a fancy one. (In King Street.)

**永大館** Yin thai kwon ; yin stands for yin thiu 遠定 and thai stands for thai phu 大埔 (In Toa Aka Lane.)

**從清會館** Chbung chhang fi kwon ; chhung stands for Chhung fa 從化 and chhiang stands for chhiang yieu 清遠. (In Prangin Road.)

(e) HAILAM. Names romanized in Hailam sound.

**瓊州會館** Keng chiu ui koan; keng chiu = kengchow. It is also called thien ho kiong 天后宮 meaning the Temple of the Queen of Heaven. (In Muntri Street.)

**蘭亭閣** Lan teng kok This is merely a fancy name. (In Church Street.)

(f) SHANGHAI and NINGPO. Name romanized in Mandarin sound.

**三江公所** San chiang kung so, "Three chiang public-house," the three chiangs (also pronounced kiang) being che kiang 浙江 kiang-su 江蘇 and kiang-si 江西 three provinces in North East China.

#### A LIST OF SOME DISTRICT NAMES IN PENANG.

##### PART I. In Town.

**Bakar Bata:** *Hokkien*, Chui\* á iō 磚仔窯 "Brick-kiln."

**Dato Kramat:** *Hokkien*, Si khām tiān 四坎店 "four shops." *Cantonese*, Si kan tin 四間店

**Dhobi Ghaut:** *Hokkien*, Sé pō· kiō 洗布橋 "washing clothes bridge."

**Jalan Bharu;** *Hokkien*, Tiong-lō 中路 "middle road." *Cantonese*, Chung lo 中路

**Kampong Bharu:** *Hokkien*, Toā chhiū kha 大樹腳 "Big tree foot."

**Kebun Limau:** *Hokkien*, Kam-á huī 柑仔園 "Orange plantation." *Cantonese*, Kam chai un 柑仔園

**Pulau Tikus:** *Hokkien*, Phù ló· ti kut 浮羅池滑

**Rifle Range:** *Hokkien*, Phah chhēng po 打鏡埔 "Firing gun field."

**Sepoy Lines:** *Hokkien*, Si pat po' 時排埔 si pat = sepoy; po' = field.

**Tarek Ayer:** *Hokkien*, Gú chhia chui 牛車水 "Bullock-cart water." *Cantonese*, Ngau chhe shui 牛車水

**Titi Papan:** *Hokkien*, Tiàu kiò thaū 吊橋頭 "Suspension bridge head." *Cantonese*, Tiu kiu thau 吊橋頭

**Ujong Pasir, or Prangin:** Siā boé 社尾 "town end." *Cantonese*, She me 社尾

#### PART II. Up-country.

Some of the names are romanized in Kheh sound, as the up-country districts are inhabited more by Khehs than Cantonese.

**Ayer Itam:** *Hokkien*, A yá i tam 亞逸依淡

**Ayer Puteh:** *Kheh*, Kung si san 公司山 "Kong-si hill."

**Bagan Jermal:** *Hokkien*, Oân tò 灣斗 "bay."

**Balik Pulau:** *Hokkien*, Phû lō 浮爐 *Kheh*, San poi 山背 "hill back," i. e., the back of the Pentland Range.

The town is called Pho 坡 by the Hokkiens, and Tanjong by the Khehs. Balik Pulau village is called Kung-si, or Bokkan, which is a corruption of the Malay word "pekan," and the only street there is called fu lo kat chhong 湖爐街場

**Balik Pulau Hill:** *Hokkien*, Phau tai téng 炮臺頂 "Fort top." *Kheh*, Phau thoï tong 炮台頂

**Batu Ferringgi:** *Hokkien*, Batu téng-gi 烙抵丁宜 *Kheh*, Ma tu tin yi 烙抵丁宜

**Batu Itam:** *Hokkien*, Batu I-tām 峇抵夷淡 *Kheh*,  
Chia kau long 進教龍 "Christian place."

**Batu Lanchang:** *Hokkien*, Batu bān chiang 峇抵  
閩漳

**Batu Uban:** *Hokkien*, Batu bān 峇抵閩

**Bayan Lepas:** *Hokkien*, Ma lâk pâi 麻咗排

**Bukit Penera:** Niú téng 豚頂 "hill-path top."  
*Kheh*, Au teng 團頂 "valley top."

**Gelugur:** *Kheh*, Lióng hang hiau 凉坑口 "cold  
stream mouth."

**Gertak Sanggul:** *Hokkien*, Boé ór 尾湖 "last lake."  
*Kheh*, Bi fu 尾湖

**Ginting:** *Hokkien*, Bún téng 文頂 *Kheh*, Vun ting kok.  
文頂 *Vun ting* is a corruption for "Ginting," and kok means  
corner.

**Jalan Bharu:** *Hokkien*, Sin lō-thaū 新路頭 "new  
landing place." *Kheh*, Sin tu thian 新渡頭

**Jelutong:** *Hokkien*, Jit lóh tōng 日落洞

**Pasir Blanda:** *Kheh*, Chuk sa wi 竹沙園 "Bamboo  
sand enclosure."

**Pasir Panjang:** *Hokkien*, Toū soa po 大沙浦 "Big  
sand field." *Kheh*, Thai sa pu 大砂埔

**Paya Trubong:** *Hokkien*, Tò bōng lai 倒蒙打, tò

bōng is a corruption for Trubong, and lāi means inside.

**Permatang Pasir:** *Hokkien*, Māng-gi kha 望吃脚  
“Manggis (mangosteen) foot.” *Kheh*, Sa kong 沙崗 “sand  
hill.”

**Pondok Upil:** *Hokkien*, Ô pi 湖邊 *Kheh*, O bi  
湖邊

**Pulau Betong:** *Hokkien*, Phù ló· bit tōng 浮爐蜜洞  
*Kheh*, Fu lo mit tong 浮爐蜜洞

**Relau:** *Hokkien*, Ô lai 湖內 “lake within” = inside  
the lake. *Kheh*, (1) Fu lo wang 湖爐橫 (2) Lau kong  
舊港 “Old stream.”

**Relau Hill:** *Kheh*, Nga kong chhai 瓦崗寨 “the hill  
fortress.”

**Sungei Ara:** *Kheh*, Sin kong 新港 “new stream.”

**Sungei Burong:** *Kheh*, Sung kian vu yiung.

**Sungei Kluang:** *Hokkien*, Bāng kha lān 望腳蘭  
= “Pengkalan” which means “landing place” in Malay.

**Sungei Nibong:** *Kheh*, Sung kiau li bong.

**Sungei Pening:** *Kheh*, Sung kiau piñ long.

**Sungei Pening:** *Hokkien* Chià<sup>a</sup> chui kāng 淡水港  
“Fresh water river.”

**Sungei Rusa:** *Kheh*, Sung kiau liu sa.

**Sungei Teeram:** *Hokkien*, Koè soa<sup>a</sup>-á 過山仔  
“Over the hill.”

**Tanjong Bunga**: *Hokkien*, Koè soa<sup>2</sup> 過山 "Over the hill."

**Tanjong Tokong**: *Hokkien*, Pún thaú kong sū 本頭公嶼 "God's islet." *Kheh*, Hoi tsu tsz 海珠寺 "sea-pearl monastery."

**Teluk Bahang**: *Hokkien*, Lán chio hui 蘭椒園 "Pepper plantation."

**Teluk Kumbar**: *Hokkien*, Kong pá 公巴 *Kheh*, Kum pa.

#### ISLETS IN THE VICINITY OF PENANG.

**Pulau Betong**: *Hokkien*, Phù lò· bít tōng 浮爐蜜洞

**Pulau Jerijak**: (1) *Hokkien*, Phù lò· ji jiak 浮爐兒惹 *Cantonese*, Muk kau shan 木冠山 "earthen-pot hill" = hill of the shape of an earthen pot. (2) *Hokkien*, Thái ko· sū 癪哥嶼 "Lepers' island," called after the Lepers' Hospital there.

**Pulau Kra**: *Hokkien*, Sū á 嶼仔 "islet."

**Pulau Rimau**: *Hokkien*, Aó·á sū 虎仔嶼 "tigers island."

**Pulau Tikus**: (1) *Hokkien*, Pēh sū 白嶼 "white island." (2) *Hokkien*, Phù lò· kiet chí 浮爐結只 *Malay* "Pulau Kechil" — small island.

A LIST OF NAMES OF SOME PLACES IN PROVINCE  
WELLESLEY AND DINDINGS.

**Province Wellesley:** *Hokkien*, Koè kāng 過港  
"over the harbour."

**Ara Kuda:** *Hokkien*, À-lah kú-tá 亞刺古打

**Ara Rendang:** À-lah lang 亞刺郎

**Aur Gading:** *Hokkien*, Song-kai loa 雙溪賴 Sungai  
dua.

**Bagan Ajam:** *Hokkien*, Chiu óng iá thaú 周王爺頭  
"Chiu god head"—the place where the god is whose name is  
Chiu.

**Bagan Dalam:** *Kheh*, Fo shui chhong 水火廠 "Ke-  
rosine oil tank."

**Bagan Lalang:** *Hokkien*, Si-kak hui 四角園  
"square plantation."

**Bagan Luar:** *Hokkien*, Bāng liáu 網寮 "net-houses"  
= fishing houses.

**Bagan Tuan Kechil:** *Hokkien*, Chún lō-thaú 船路頭  
"vessel landing place."

**Bukit Mertajam:** *Hokkien*, Toā soa<sup>n</sup> kha 大山腳  
"Big hill foot." *Kheh*, Thai san kiok 大山腳

**Bukit Minyak:** *Hokkien*, Tām-mái (Damar) soa<sup>n</sup> 淡媽  
山 "Damar hill." *Kheh*, Pa ma san 把麻山

**Bukit Seraya:** *Hokkien*, Sin pa 新地 "new forest."  
*Kheh*, Shin pa 新地

**Bukit Tambun:** *Hokkien*, Tambun 淡汶 *Kheh*,  
Tam mun 淡汶

**Bukit Tengah**: *Hokkien*, Bakit téng-gá 武吉丁牙  
*Kheh*, Vu tsz teng-a 芋子丁芽

**Butterworth**: *Hokkien*, Pak hui 北海 "north sea."

**Cherok Tokun**: *Hokkien* Tok-kun tō 督君肚 *Kheh*,  
*Tokun tu* 督肚君

**Jalan Bharu**: *Hokkien*, Sin lō-thau 新路頭 "new  
 landing place." *Kheh*, Sin thu thian 新渡頭

**Juru**: *Hokkien*, Gi bú 義府 *Kheh*, Ngi fu 義府

**Kapala Batas**: *Hokkien*, Pa-la ba-tai

**Kubang Semang**: *Hokkien*, Ko-pa sam-báng 高巴  
 三夢. *Kheh*, Thai ng tham 大魚潭 "Big fish pond."

**Lahar Ikan Mati**: *Hokkien*, Ikan mati.

**Machang Buboh**: *Hokkien*, Pa-siā tō 巴錫肚  
*Kheh*, Ta siak tu 打錫肚

**Maklom**: (1) *Hokkien*, Siu hui 新園 "new plantation."  
 (2) *Hokkien*, Pa-tang (Batang) boé 巴東尾 "Batang end."

**Mengkuang**: *Hokkien*, Mang kuang. *Kheh*, Mang kaung

**Nibong Tebal**: *Hokkien*, Ko ieu 高淵 "Krian." *Kheh*,  
 Kow yen.

**Padang Manora**: *Hokkien*, Jara.

**Pagar Tras**: *Hokkien*, " Pa-siā tō sèng-tiē 巴錫肚聖  
 堂 the holy church at Machang Buboh. *Kheh*, "Ta siak tu"  
 shin thong 打錫肚聖堂

**Parit Buntar**: *Hokkien*, (1) Sin ba lai 新峇來 "new station." (2) Bün ta 汶礁

**Penaga**: *Hokkien*, Pün ná gá 本拿牙

**Permatang Bandahari**: *Hokkien*, Ba tang bā lí 峇東夏里

**Permatang Pasir**: *Hokkien*, Batang Pasir; *Kheh*, Matang Pasir.

**Permatang Pau** *Hokkien*, Batang Po 峇東保 *Kheh*, Matang pu 馬登保

**Yoko Brangan**: *Hokkien*, Léng chū tiám 冷水店 "cold drink shop." *Kheh*, Lióng shuǐ tiám 冷水店

**Sempang Ampat**: Sin pang àm pat 新邦安拔

**Sungei Bakap**: *Hokkien*, Jiáu"í 摩夷 "Jawi." *Kheh*, Yan yi.

**Sungei Derhaka**: *Hokkien*, Sungei laka. *Kheh*, Sa kong mui 沙崗尾 "sand hill end."

**Sungei Rambai**: *Hokkien*, Káng kha 脚港 "river foot." *Kheh*, Kong ha 港下 "river below."

**Tasek**: *Kheh*, Pa seh.

**Tebing Tinggi**: *Hokkien*, Sow-á 山仔 "small hill."

**Dindings**: *Hokkien*, Kaú sú 九慎 "nine islands." *Kheh*, Kau chi liu 九子連 "nine links."

**Bruas**: *Hokkien*, Jít lóh sa 日落沙

**Lumut**: *Hokkien*, Ang thò khàm 紅塗砌 "red earth cliff." Cantonese, Hung hom 紅磡

**Pangkor**: *Hokkien*, Pang ko 望閣

## INDEX OF THE STREETS.

A kui ke	Ah Quee Street
A-phièn kong-si ke	King Street
A-iá i-tám lō	Ayer Itam Road
A ék tò-lün	Waterfall Road
Ang mó· lō	Northam Road or Farquhar Street
Ang mó· kū thióng	Northam Road
Ang mó· ôh chéng	Farquhar Street
Ang mó· sin thióng	Western Road
Bán an tái	Kulim Lane
Bán Tek hong lō	Sungei Ujong
Bang-ka-lí hāng	Argyle Road
Batu Gautong	Scotland Road
Béng hì tài	Kulim Lane
Béng san lō-thaú	China Street Ghaut
Cháp chhit keng	Chulia Lane
Cháp-jí keng	Queen Street
Cháp keng chhù	Carnarvon Street
Che-tí ke	Penang Street
Chhá kang ke	Bishop Street
Chhá ló·thaú	Chulia Street Ghaut
Chhá tiá·	Maxwell Road
Chhá tiá· an	Tek Soon Street
Chhat bok ke	Bishop Street
Chhaú-po· hai-ki· lō	Esplanade Road
Chhèng iók keng	Magazine
Chiú lóng lō-thaú	Church Street Ghaut
Gi-hin ka	Church Street
Gi-hin-ke lō-thaú	Church Street Ghaut
Gi-hok ke	Rope Walk
Goā koan	Downing Street

Gō· pha teng	Magazine
Gū chhia ke	Prangin Road
Gū chhia chái	Burmah Road
Gū kan-tàng	Chulia Street
Hai ki <sup>a</sup> sin lō·	Weld Quay
Hiang-káng lō·	Hong Kong Street
Hô· chio tiā·	Sungei Ujong
Hô· seng kong-si ke	King Street
Hoan-á hì-hul <sup>b</sup> ke	Kwala Kangsa Road
Hoan-á thióng	Carnarvon Street
Hoé chhia lō·	Gladstone Road
Hong chhia lō·	Brickkiln Road
Huí chiu kong-si ke	Prangin Road
Iá kha	Pitt Street
Gia-lán a-feng	Hutton Lane
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Jí-lòh-tóng lō·	Jelutong Road
Jí-pán ke	Cintra Street
Kam-á húi <sup>c</sup>	Dato Kramat Road
Kám-kong lat	Carnarvon Lane
Kám-kong-lat hoai <sup>d</sup> lō·	Toa aka Lane
Kam kong mǎ-lák-ka	Kedah Road
Káng-á khau	Beach Street
Kau keng chhù	Penang Street
Kau keng chhù aū	King Street
Kéng kui <sup>e</sup> ke	Keng Kwee Street
Khai Héng Bí lō·	Prangin Road
Khai Héng Bí bi-ka	Maxwell Road
Ki-lin hō·	Green Hall
Kiám hù-á häng	Fish Lane
Kiám hù tiā·	Prangin Lane
Kièn goán ke	Armenian Street
Kiet-léng-á bān san	Chowrasta Road or Tamil Street
Kiet-léng-á ke	King Street or Chulia Street
Kiet-léng-á ke lō-thaú	Chulia Street Ghaut
Koai <sup>f</sup> laú-á	Acheen Street
Koai <sup>f</sup> laú-á lō-thaú	Acheen Street Ghaut
Koau-á kak	R. C. O. Front
Koan-im téng aū	Stewart Lane

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Koan im tēng chéng	Pitt Street
Koè káng-á	Bridge Street
Koè káng-á sin lō	MacNair Road
Koè káng-á tē it tiāu lō	Magazine Road
Koè káng-á tē jī tiāu lō	Noordin Street
Koè káng-á tē sa <sup>a</sup> tiāu lō	Presgrave Street
Koè káng-á tē si tiāu lō	Thye Sin Street
Koè káng-á tē gō <sup>a</sup> tiāu lō	MacCallum Street
Koè káng-á tē lák tiāu lō	Katz Street
Koè káng-á tē chhit tiāu lō	Cecil Street
Koè káng-á tē péh tiāu lō	Heriot Street
Koè káng-á tē kuí tiāu lō	Sandilands Road
Kóng hok kū hāng	Market Lane
Kū Hö Háp siá ke	Queen Street
Kū Hö-seng kong-sí ke	King Street
Kū kha khu	Penang Road
Kuí <sup>a</sup> -tang ke	Penang Street
Kuí <sup>a</sup> -tang toā peh kong	King Street
Lák chhī lō	Magazine
Lám chhīu-á	Carnarvon Street
Lám hoa i <sup>a</sup> ke	Muntri Street
Lâng chhia tēng pai koan	Penang Road
Lêng chiak chhū chéng	Penang Road
Liên hoa hô	Farquhar Street
Liōng san tóng lai	Cannon Square
Lô-lin ke	Chulia Street
Lû-sòng lé-pai-tig chéng	Bishop Street
Má kaú ke	Penang Street
Mi <sup>a</sup> soà <sup>a</sup> ke	Kimberley Street
Oân thaū-á	Prangin Road
Oân-tó <sup>a</sup> lō	Bagan Jermal Road
Pak kan lai	Che Em Lane
Pâ sat ke	Market Street
Pang lóng	Bridge Street
Peng pâng lō	Barrack Road
Phah chióh ke	Acheen Street
Phah chióh ke lō-thaú	Acheen Street Ghaut
Phah phau ke	Cintra Street
Phah soh bâng	Kimberley Street or Rope Walk

Phah tāng ke	Armenian Street
Phah thih ke	Beach Street
Phah thih ke hāng-i	Toa Aka Lane
Phi chun lō	Phee Choon Lane
Piā chhū lō	Hospital Road
Po lā aū	Union Street
Po lē khau	Light Street
Pún thaū kong hāug	Armenian Street
Pún thaū kong bāng lō-thaū	Armenian Street Ghaut
Sir lú kong-si ke	Chulia Street Ghaut
Sir Tân kong-si ke	Seh Tan Court
Sir Ti kong-si ke	Kimberley Street
Sir Tiu kong-si ke	Carnarvon Street
Séng hōng biō lō	Bridge Street
Sek-lān-ní hāng	Love Lane or Muntri Street
Sek-lān-ní lé-pai-tiū aū bāng-i	Argus Lane
Sek-lān-ní óh chéng	Farquhar Street
Sí-kak chhū	Carnarvon Street
Sí khám tiām	Dato Kramat Road
Sín boé	Beach Street (Ujong Pasir)
Siang hó chhū chéng	Leith Street
Sin bān-san	Market Street Ghaut
Sin hai-lām kong-si ke	Muntri Street
Sin hí-tai	Drury Lane
Sin ke	Campbell Street
Sin ke hoai <sup>n</sup> ke	Cintra Street
Sin-ke thaū	Buckingham Street
Sin toā-múi <sup>n</sup> -laū	Campbell Street
Sòa <sup>n</sup> thaū ke	Kimberley Street
Sún-tek kong-si ke	Bishop Street
Tai jin koan	Downing Street
Te-chiu ke	Kimberley Street
Te-chiu kong-si aū	Pitt Lane
Tek Sún chhū pi <sup>n</sup> ke	Transfer Road
Tek sún lō	Tek Soon Street
Thai gú hāng (or thai gú aū)	Malay Street
Thai gú hāng lō-thaū	Malay Street Ghaut
Thai ko hāng	Muda Lane
Thaū tiau lō	Magazine Road
Thó khò (or thaū khò) ke	Beach Street

246 CHINESE NAMES OF STREETS IN PENANG.

Tiau kió thaí	Penang Road (Titi Papan)
Tiau láng ke	Penang Road
Tjiong ke	Beach Street
Tiong lō·	MacAlister Road
Toā ba-lái	Pitt Street
Toā chhai bui <sup>a</sup> lō·	Race Course Road
Toā chhèng khang	Cannon Street
Toā chui chí <sup>b</sup>	Chulia Street Ghaut or Pitt Street
Toā ke	China Street
Toā ke lō·-thaú	China Street Ghaut
Toā lō· aū	Perak Road
Toā mū <sup>c</sup> laú	Chulia Street
Toā-mū <sup>c</sup> -laú hoái <sup>d</sup> ke	Carnarvon Street
Toā mū <sup>c</sup> laú lai	Sek Chuan Lane
Toān lō·-sin	Beach Street
Toān pa-li	Green Hall

## The Orang Laut of Singapore.

"We tack not now to a Gallant Prow." Kipling.

At the time of the occupation of Singapore by the British, there were living on the island, then densely afforested, one or two races of natives, known as the Orang Kallang and Orang Selitar. The former of these lived on the river of the same name, the latter along the rivers of the Johore Strait. Some accounts of these two tribes was published by Logan in Vol. i. of Logan's Journal in 1847, and illustrated by outlines of heads. The Kallangs were removed by the Tumunggong of Johore from the Kallang river to Pulai River when the island was ceded to Britain. They formerly consisted of 100 families, but in 1847 the small pox had reduced them to eight. They were said to have lived exclusively in boats, neither building huts nor cultivating any plants. Their language at that time appears to have been Malay, and neither Mr. Logan nor Mr. Thomson who described the Orang Selitar were able to elicit any words of their original language. Of these races it is not easy now to find any traces, as they have become amalgamated with the Malays, adopting not only their language but also their customs and religion. Lately however the authors of this note visited Kampong Roko, on the Kalang river, and made an attempt to collect what information was procurable concerning this interesting people. They were accompanied by Mr. R. H. Yapp (of the Cambridge expedition) who took photographs of some of the older men who were stated to be of this race. Kampong Roko itself is a Malay village of the ordinary type, built on a mud bank of the Kalang river and containing a very mixed population. The natives have for many years employed themselves in fishing and in preparing Nipah leaves for cigarettes-wrappers, so that the ground is covered for a considerable depth with a dense mass of waste fragments of leaves. We visited the village on Nov. 12th, and sought out the oldest inhabitants, the Batin Jenang, and an old man named Rabu, together with one or two others, and spent a long time with them in endeavours to

obtain information as to the language, traditions, etc., of the *Kalangs*, but they seemed to have forgotten most of the language, and but little information could be obtained, though what was obtained was of considerable interest. They affirmed that they were *Orang Daik* (*Malay*) from *Lingga*, and stated that there were at least eight tribes who used to visit this district, and were mostly pirates. They were the

Orang Tambus	Orang Sekanak
Orang Mantang	Orang Barok
Orang Galang	Orang Moro
Orang Pusek (or Persik)	Orang Sugi

The first two always lived in boats, having no fixed habitations, and were not piratical. The rest were all bad pirates, who lived on various islands and travelled as far as *Siam* and *Cochin China* on piratical expeditions. In the time of Sultan Mahmud, *Raja Lang* was the chief of the *Galangs*, and *Orang Kaya Mepar* (*Che Muntei*) was chief of the *Baroks*, and his grandson is now head. They have a village at *Singkep*, or as one of the men said, on *Lingga*. The *Persiks* now live at *Pulau Persik* between *Retik* and *Daik*. They had a *Batin* as chief, but no *Jenang*. The *Orang Tambus* now live in a village in *Silat Durian*, among the *Riau* islands. They had a *Batin* only. The *Orang Mantang* lived on *Pulau Mantang* and were very numerous. They had a *Batin*. The *Orang Galang* lived mostly in *Pulau Karas*, in the *Riau Archipelago*, and had a *Batin* only. The *Orang Sekanak* lived on an island between *Pulau Retik* and *Pulau Daik*. The *Orang Sugi* live near *Sulit*, in *Riau*, and had a *Batin*. The *Orang Moro* lived in *Pulau Moro*, near *Pulau Sugi*; but they were also said to belong to the *Orang Daik*. It should be noted that among the *Sakai* tribes of the Peninsula, the *Batin* is usually if not invariably considered as the superior of the *Jenang*. Here however at *Kampong Roko* it was stated quite positively that the *Jenang* was the higher official.

The following non-*Malay* words were obtained from these men:

*Koyok*, a dog. Used by all the above mentioned tribes.

*Kiyan*, come, come here (lit. thither) cf. *Belandas* tribe *Chan*.

*Kiyun*, go away (lit. hither) cf. *Belandas* *Chun*.

*Kigoh*, far off.

*Sika*, come here, e.g., *Siku makan* come here and eat.

The following words are probably all of Malay origin:

*Jengkeng* or *bidah*, a boat (sampan or koleh).

*Lanchang*, a sailing vessel.

*O-neh* or *O-ne*, friend or comrade, used in addressing other members of the tribe whether young or old, e.g., *O-neh Nan Kamana?* Where are you going, friend? The *O* in *Ouch* may be merely interjectional.

*Diko* = *engkau*, also used in addressing other tribesmen, but less polite or less friendly than *O-ne*.

*Pohon* was used instead of *Polo*, tree, as on the East Coast and elsewhere.

The pronunciation was said to be peculiar, thus: *s* was pronounced like a soft *z*, e.g., *Nazi* for *Nasi*; *r* like *h*, e.g., *Parang* for *Pahang*; *k* like *lh*, e.g., *Khain* for *Kain*; *Khakhi* for *Kaki*.

Too much stress however must not be laid upon these examples of pronunciation, as although what was heard is faithfully recorded, the personal equation enters too largely into this sort of questions for them to be accepted without repeated checkings. A Sakai, for instance, will occasionally pronounce one and the same word in two distinct ways, probably through nervousness at being questioned by an European.

Slight as these traces are, if taken in conjunction with the important fact that the constitution of these tribes corresponds fairly closely to that of Sakais (as is shown by the Sakai names of the chiefs) they appear to suggest the theory that the Sea-gypsies of Singapore owe their origin largely from Sakai hill-tribes in the Riau-Lingga Archipelago; that these, whether through pressure of the Malay immigration or from other causes, took to the sea, and reinforced probably by more than a sprinkling of mere Malay adventurers, developed into the famous piratical race which under the generic name of Orang Laut became for a space the terror of all who sailed these Eastern seas. Such an evolution of one of the mildest mannered and most timid races of the earth would certainly appear unaccountable, but if it is to be rejected, it involves us in still greater difficulties. The evidences may be briefly enumerated as follows.

(1.) The constitution of the tribe under Jinang and Batin.

(2). The use of undoubted Sakai words; of these *Koyok*, *Kiyon*, and *Kiyun* are all words allied to those used by the Belandas tribe in Selangor.

(3) The Sakai "terumba" or racial records as preserved by the Bessi tribe in the Kwala Langat district (Selangor), which explicitly state that the ancestors of the original tribe descended to the sea and became sea-folk (*turun kalarut jadi raiat laut*) and that the sea-folk became pirates (*Raiat laut jadi Bajan*).

Further investigations when opportunities occur may supply more extensive information as to these wild tribes, now so nearly vanished. The foregoing notes, incomplete as they are, show that there are still some records worth the attention of any who have the chance of studying the race, and research in the district of Selitar and Pandan, where the tribe, as late as 1847, were in a very primitive state of civilisation, and in the Carimons, and neighbouring islands, may throw more light on the history and relationship of the Orang Laut.

*W. W. Skeat.*

*H. N. Ridley.*

## Cases of Lightning Discharge.

By G. E. V. THOMAS, A.M.I.C.E.

*Communicated by H. N. Ridley.*

The study of lightning phenomena is of great interest and importance, and as the conditions which obtain in Malaya are extremely favourable for the observation of such phenomena, as regards the frequency and violence of thunder storms, it is somewhat surprising to find that the accounts so far available are few. Those here given are of interest as being descriptive of unusual effects.

In well-marked cases of the destructive effect of lightning on trees, the tree struck is completely shattered. Such instances are familiar, probably because they are immediately apparent as the result of a severe storm; but the gradual decay and death of a number of trees in the vicinity of one struck, which would seem to be a frequent after-effect, is a form of damage which, as far as the writer can ascertain, has not previously been noted.

The following account, from the diary of Mr. H. N. Ridley, Director of Gardens and Forests, S. S., describes such an effect, which occurred in a coco-nut plantation in Singapore.

" May 3rd 1898. Visited Siglap and saw a place where, more than a month previously, a tree was struck by a tremendous flash. From this tree in a semicircle (there being none on the outer side) eleven more trees died. The deaths appeared to radiate out from struck tree gradually. Three were still standing; they bore young fruit and flowers, but the whole of the foliage looked as if burnt. One was still alive and putting up a fresh leaf. One, covered with fungi, had been dead some time. Why this progressive death? Inspector tells me he saw a similar case where, some time after the death of coco-nuts, some mango-steen trees withered away in like manner.

A similar instance recently occurred in the Botanical Gardens, Singapore, and was brought to the writer's notice by the

same observer. In this case two trees (*Erythrina* and *Detarium*) appeared to have been struck simultaneously. Though the damage apparent was very slight and confined to the bark, decay began in the *Erythrina* within ten days. Another *Erythrina* adjoining died soon after, but the *Detarium* was unhurt. Another example occurred on Government Hill, when a sugar palm was struck (May 2nd, 1859). The writer saw the tree two hours afterwards and obtained the following account from a native eye-witness. "About half past one there was a single peal of thunder, very near, but I saw no flash, only a general glare. Less than one minute afterwards smoke came from the tree and then flames, about half way up the trunk. The fire went up very quickly and I ordered the tree to be cut down." When the writer saw the tree, the fibrous material which covers these palms was still smouldering, but the closest examination failed to reveal any traces of damage other than that caused by fire, and the surrounding trees were quite unhurt. Three months afterwards, however, the similar palms in a radius of twelve or fifteen feet from that struck were completely dead.

A remarkable point in this instance is that although the palm struck was over sixty feet in height, and surrounded by others even taller, the flash should have struck it in the middle. Mr. Ridley has noted a similar case in which an explosion took place in the fork of a Rambutan tree only six feet above the ground between the base of the fork and a birds-nest fern, and set fire to the roots of the fern. There was no damage done to this tree except from burns, but a chicken at its base was killed.

The first of the following accounts, furnished by Mr. A. Knight, is of particular interest, as the phenomena noted were of an unusual kind and did not occur during a storm. Mr. Knight writes:—"On the 12th September, 1898, I was driving home from town, and when in the lower part of River Valley Road I saw a flash in front, and there was a loud report which made my pony start forward. On reaching my house, Grassdale, I found that the ladies of my household had been much startled by the explosion. Two of them had been near the entrance, standing facing towards town, while two others were walking from the direction of town and were about a third of a mile from the house. To the former two a flame-coloured flash seemed to fall

in front of them ; to the latter two a bright light seemed to be thrown in their faces and the loud report was instantaneous. These two afterwards detected a sulphurous smell, and all felt a sensation like an electric shock. There had been some distant thunder and rain shortly after noon. It had afterwards been bright but stormy looking ; and though clouds were gathering in the evening, there was at that time no thunder or lightning. Shortly afterwards there was heavy thunder near, followed by a copious shower. A. K."

Mr. Knight's second account also describes a form of discharge about which very little is known. It is unfortunate that no photograph was obtained, as it would seem from comments in a recent electrical journal that no photograph ever has been obtained of this phenomenon, and it has been customary to discredit statements as to its appearance. Mr. Knight's note differs from the more usual accounts, in which the ball of fire is said to run about before bursting, but is closely analogous to a case quoted by Dr. Oliver Lodge,\* in which however the ball is described as of a reddish yellow colour, changing to vivid white. Mr. Knight's account is as follows :—" On the 14th October, 1898, there was a very severe thunder squall—strong wind, violent rain and much thunder, not very distant. It came on suddenly, about 7 p.m., as we were going down to dinner ; and as I was about to take my seat at the end of the table, facing the back of the house, I saw an explosion in the air, like that of a fireball or bomb, probably four or five feet above the ground, and there was a loud bang. The light appeared greenish white. There is no doubt that it was in the back garden, as it was located there by some neighbours whose line of sight was at right angles with mine."

Mr. Ridley reports also the two following cases of globular lightning, differing from that of Mr. Knight in that the phenomena occurred outside the storm. " Some few years ago, I was sitting in my verandah, about 7 p.m. ; it was quite dark, and there was a thunderstorm going on over the Economic Garden. Suddenly there was an intensely brilliant flash and instantaneous explosion close to the house. My back was towards the garden,

\* Lightning Conductors and Lightning Guards. Prof. O. J. Lodge.

so that I only saw the reflection of the light. Mr. Feilding was at the time passing along the road below the hill on which my house stands, when he saw a ball of fire descend in a curve, slowly, about 50 yards from the house, close to the ground, between him and the house. It appeared to explode with a tremendous noise. Careful examination of the grass where the ball fell showed no trace of burning or other mark. Simultaneously with this phenomenon, a large tree (*Irenia*) in the Economic Garden was struck by lightning, but hardly injured. This stroke was the last flash of the storm."

(2) "A thunderstorm was taking place over the Bukit Timah Road, beyond the Economic Garden, one Sunday about two years ago, at between one and two p.m. The sky was bright, but not cloudless, and the sun brilliant over my house, and I went out on the lawn to look at the distant storm to the North. I saw a zigzag flash apparently about three-quarters of a mile away, and, almost absolutely simultaneously, a peal of thunder came from behind me, and behind the house to the west. I saw nothing to account for this, but Mr. Robertson-Glasgow, who was sitting in a room facing west, saw a luminous body, not ball-shaped, though more or less rounded, moving in a downward curve to the South, till it disappeared behind some trees, and was followed by the thunder. It was less bright than the sunlight."

The only local cases of damage to buildings reported are those at the Cape Rachado and Muka Head Lighthouses. The writer was fortunately able to inspect the former not long after the occurrence, and found it to be an interesting example of side flash, a discharge having left the very fine "Lightning Rod Conference" copper conductor at a bend and made sundry holes in solid masonry walls, traversing two rooms and finally being dissipated over the sheet of rain water collected in a courtyard. The Lightkeeper's report shows that in this case the "expediture of observers" deprecated by Dr. Lodge, nearly occurred, as the matting under two low wooden beds, on which some of the lighthouse attendants were lying at the time, was torn to pieces. The report concludes:—"In that time Serang, Tindal and two Lascars is inside the room grate of the Almighty pity there had not been anything happen."

The Muka Head case (October 9th, 1897,) affords another example of the inefficacy of the old-fashioned single conductor, which was supposed to protect a building of any size if only it were high enough, and had nicely sharpened points and an earth resistance measuring a fraction of an ohm. From the interesting report by Mr. Willis,\* the Lighthouse keeper, it would seem that a flash struck the conductor, leaving evidence by tearing off a gunmetal brace about half way up. The discharge then left the heavy copper rod and proceeded to earth by a thin telephone earth wire, thirty feet of which was completely deflagrated. From some further reports collected by the writer, it would seem that Penang Hill would form an excellent site for observation, as the disturbances noted by the Signal Sergeant stationed there are exceptionally freakful and violent. He states that in April, 1898, a telegraph pole was cut in half horizontally as if it were sawed off." The telegraph wire was also cut in three or four places and three insulators broken. On another occasion, a discharge passed through a large earthenware jar, making one hole of several inches in diameter, and a second of less than one inch, and finally excavating part of the floor near the jar.

An attempt to explain the conditions which serve to bring about results like these is not within the scope of the present notes, but the writer may, perhaps, be permitted to invite further lightning notes, accompanied where possible by photographs. Such records are of the greatest possible assistance in promoting the general knowledge of a series of phenomena about which there is still much to be discovered.

G. E. V. Thomas.

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\* Kindly furnished by Mr. O. V. Thomas, Acting J. Supt. Govt. Telegraphs, Penang.

## Notes from the Sarawak Museum.

### ON A REMARKABLE DIPTEROUS LARVA.

During a recent visit to Mt. Penrissen, Sarawak, I found in sand beneath some overhanging cliffs numerous small pit-falls exactly like those made by the ant-lion; some of these when examined were found to contain a curious worm-like larva which has since proved to belong to a fly of the genus *Vermiles*, family *Leptididae*. The body consists of 11 segments, into the first of which the head can be completely retracted, five annuli can plainly be distinguished on segments 2, 3, and 4, but are less well marked on the others; the 10th consists only of three. The middle annulus of the fourth segment bears on the ventral surface a fleshy knob (abdominal pseudopod) which is surmounted by a small semicircular chitinous comb longitudinally placed; the eighth segment ventrally bears a median tuft of setae, and a fringe of similar setae marks the posterior border of the 9th segment, this also carries on its ventral surface 2 median setigerous papillæ. The 10th segment, which is set at somewhat of an angle to the 9th, bears on the dorsal surface at its anterior border a fringe of very strong setæ directed backwards. The 11th and last segment terminates in four finger-like processes clothed with delicate hairs, the anus opens on its ventral, two stigmata on its dorsal surface. The last three segments are markedly larger than any of the preceding ones. The larva burrows into the sand head first, until completely buried, and then proceeds to form its pit-fall in the following manner: the more deeply buried tail-end acting as a fixed point, the anterior half of the body is curved about in all directions, each curving motion being followed by a rapid straightening out, which jerks the sand away for some little distance; since the tail is fixed, the result of many of these motions is to produce a circular depression with sloping sides; at the bottom of this lies the larva, ventral surface uppermost, the posterior half of the body still buried, the anterior half exposed and straightened out. If now an ant is introduced into the pit-fall, the exposed part of the larva suddenly curls up in a spiral coil, the prey being generally included

in the coil and impaled by pressure on the chitinous comb of the 4th segment; a hold is then gained with the mouth, and after a few minutes, with a rapid sinuous motion, the larva straightens out and disappears below the sand, carrying its prey with it. If the larva is not successful in catching its prey the first time, it flings sand about in all directions by rapid switching movements, and the victim, unable to obtain a foothold on the sliding sides of the pit-fall, falls down to the bottom; or occasionally the larva actually strikes like a snake at the victim as it endeavours to escape from the toils, indeed many of the actions of this larva are quite snake-like, and an ant enclosed in one of its coils reminds one of nothing so much as of a small mammal in the grasp of a python. Occasionally the prey seems somewhat out of proportion to the larva, but by means of the numerous setæ on the large posterior segments a very firm grip is obtained in the sand, and I have never yet seen an insect of moderate size make good his escape after having been once seized. I brought down to Kuching alive several of these larvae, and one or two pupated; shortly before pupation, the larva leaves its pit-fall and lies close to the surface of the sand, though completely covered; the anterior segments become much swollen and retracted, until the integument bursts, revealing beneath the brownish pupa; by some convulsive movements the whole pupa now appears at the surface, the larval skin being slowly shuffled off backwards, but never becoming entirely freed, so that the posterior end of the pupa always presents a somewhat ragged appearance. Unfortunately the heat of Kuching proved too much for these pupæ, and none came to maturity, but shrivelled up; some Leptid flies which I obtained on Penrissen are, however, I am sure, the adult stage.

#### ON A MALE SPECIMEN OF *PURLISA GIGANTEUS* DIST.

A specimen of this handsome Lycaenid butterfly was described and figured by Distant in his *Rhopalocera Malayana* (p. 250, Tab. XXI, fig. 28, 1885), but the sex was not stated either in this or in two previous descriptions (Distant, Ent. Month. Mag. Vol. XVII, p. 245, 1881, and Waterhouse, Ad. Vol. I, pl. XLVI, 1882), and de Nicéville in his "Butterflies of India," Vol. iii, p.

385, writes :—" I have not seen this species. The sex of the specimens described is not stated, and it would be hazardous even to guess from the figures and descriptions what sex they may be."

With the capture of an undoubted male specimen on Mt. Matang, Sarawak, at an elevation of 3,500 feet, in March of last year, I am enabled to state with absolute certainty that Distant described a female, and as the male sex has never been described I now append a short account of it.

Upperside: forewing as in the female, hind-wing with the dark fuscous area much smaller, commencing as a narrow band at the external angle it rapidly narrows to a thin marginal line; costal area grey; underside rather paler than in the female. The inner margin of the hind-wing just interior to the submedian nervure is shortly folded opposite the abdomen, the fold containing numerous long scent-hairs. This sexual character though common enough in the Nymphalidæ and Papilionidæ, is only met with, amongst the Oriental Lycaenidæ, in the genus *Simiskina*. The neuration of both sexes is identical. Mr. H. H. Drury has already recorded this species from Borneo in a paper on the Lycaenidæ of the island (P. Z. S., 1895, p. 602), but his specimen was a female.

#### ON THE FEMALE OF *DODONA ELVIRA* STAUD.

The male of *Dodona Elvira* was described by Staudinger in "Iris," Vol. IX. p. 239, pl. V, fig. 6, (1896), together with many other new Bornean species. Females of this species are extremely rare, for though I have caught over one hundred males, I have only been able to secure one female; as that sex has never been described, I do so willingly here:—Larger than male. Upperside ochreous; forewing with base broadly shaded with fuscous, a black spot or costal margin continuous with a fuscous discal fascia, a short line of the same colour, closing the cell and almost fused with the discal fascia. Another black spot on the costal margin, continuous with a very pale fuscous fascia, apex and external margin broadly bordered with black. The border containing some obsolescent, ochreous, submarginal spots. Hind-wing as in the male. Underside ground-colour more rufous

The fascias are white, tinged with ochreous, instead of silvery, and fascia No. 4 on the forewing is very broad, fusing with the white litura which in the male occurs at the base of the second median interspace. Expanse 48 mm. Matang, 3,000 feet. June 1897.

#### ON THE SYSTEM OF CATALOGUING ADOPTED IN THE SARAWAK MUSEUM

In the year 1874 an American, Mr. Melville Dewey, invented and published a system for classifying and cataloguing scientific and other literature by means of employing decimal numbers, this system is known as the Dewey Decimal System. Curiously enough it has received but a small amount of attention in England and her dependencies, a most astonishing fact when one compares its perfect method and simplicity with the systems now in vogue in the majority of large home and colonial libraries. Mr. Dewey is in short the Bertillon of scientific cataloguing, less fortunate than his distinguished prototype, inasmuch as he has still to receive a wide-spread recognition.

The system consists of dividing the subjects, on which literature has been produced, into groups; to each group a number is assigned: each group is subdivided and each subdivision is characterised by a decimal number, following the group number. Thus, under such a number as 600 would be found all works dealing with Geography; a subdivision of this, Europe, would have the number 600.1; Asia, 600.2, etc. The countries making up these main divisions would again have a number—England 600.11, Scotland 600.12, Ireland 600.13, etc., etc., whilst still greater subdivision can be provided for by the addition of another decimal, thus:—Bedfordshire 600.11.1. Naturally enough countless modifications of this system have been suggested and tried.

On contemplating the somewhat chaotic system, or rather, lack of system, employed in cataloguing the zoological specimens in the Sarawak Museum, it seemed to me advisable to re-catalogue the collections by means of a modification of the Dewey Decimal System. Each class of animals was marked with a letter:—Mammals, A. Birds, B. Reptiles, C. Amphibia, D. Fishes, E. Each family of these classes was numbered in order

1, 2, 3, etc., each genus with a decimal number following the family number, each species with another decimal number following that of the genus. Let me illustrate this with an example taken from the catalogue of Fishes.

Class Pisces = E

Order 1. Pungostomata

Sub-order. Selachoidae

Fam. Carchariidae = E 1

Genus Carcharias = E 1.1

Species laticaudus = E 1.1.1

with specimens a. b. c. d.

Species acutus = E 1.1.2

with specimens a. b. c. d., etc.

Fam. Lamnidæ = E 2

Genus Lamna = E 2.1.

and so on.

By this means all necessity of check lists, registers and double entries is obviated; a glance at the catalogue reveals the number of specimens of any given species in the collection, the number of duplicates (if any), the desiderata, the number of species in a genus, of genera in a family, whilst the labels of the individual specimens with numbers corresponding to the catalogue numbers are equally eloquent.

In cataloguing zoological or botanical specimens by this decimal system, one meets with a difficulty which does not occur in cataloguing literature, since literature can be grouped under subject-headings which always remain constant, such as Geography, Geology, Meteorology, etc.; but every biologist knows that new species, new genera, even new families are constantly being created by the systematist, either from newly discovered forms or by the splitting up of old assemblages (for example the Eastern members of the genus *Sciurus* have been recently divided by Mr. Oldfield Thomas into five genera), all of which necessitates the interpolation of new catalogue numbers into the pre-existing series, and I must confess that, as yet, I have been unable to evolve a perfectly satisfactory means of coping with this difficulty. New species may generally be readily disposed of by being added on to those already catalogued, but new genera can not be so treated, since, by so doing, they may be separated

from their nearest allies; and the same holds good when treating with new families. It is, of course, necessary when writing the catalogue, to enter and number in order every species, genus and family already recorded from the area in which the collections are made, whether or no the collection undergoing cataloguing contains all those species and genera; if this is done, a double advantage is secured—the dreaded interpolation is only needed when new species or genera are discovered, and the catalogue becomes a complete faunistic list of the collected-over area, and the importance of such faunistic list is well-recognised by every museum curator. My own method of interpolating new genera into a previously catalogued series has been as follows:—The new genus is numbered with a fractional number, the numerator of such a fraction being the number of the nearest ally of the new genus. The denominator the last two figures of the year in which the new genus was described. For example, let us imagine that a new genus closely allied to *Hestia* was discovered this year. The number of genus *Hestia* in the Sarawak Museum catalogue of Lepidoptera is He 1.1. The new genus would consequently be numbered He  $\frac{1}{1}$ : the number is cumbersome and somewhat destroys the symmetry of the series, but it is significant, and that feature I have endeavoured to hold constantly in view during my re-cataloguing labours.

R. H. Shelford.



## The Hot Springs of Ulu Jelai.

BY A. D. MACHADO.

Having recently occasion to visit the extreme Ulu of the Jelai district, Pahang, in connection with certain prospecting operations which I was then undertaking for the Malayan (Pahang) Exploration Co., I heard from Sakai aborigines of the existence of hot springs in this neighbourhood. These springs I found to be situated on one of the spurs of the main range of hills dividing Pahang from Perak, about Latitude 4° 20' N., and Longitude 101° 30' E. Our Sakai guide, who visited this spot ten or more years ago, described the phenomenon as one eruptive fountain of hot water and steam—the water, according to him, ascending to a considerable height, a true Geyser in fact. I saw quite a different thing. I found seven non eruptive springs of hot water and steam, the former flowing over sloping terraces or basins of granitic boulders, till finally they joined on to a stream called the Chai-ang, which in turn drained into the Jelai. If the statement of the Sakais is credible, and I have no reason to disbelieve him, there has evidently been a change in the structure of these springs, within the short space of ten years, a very short geological epoch indeed. The usual characteristic sulphurous odour pervaded this place; those curiously fretted rims of the boulders over which the water flowed, due doubtless to the deposition of Silica, sulphur, etc., are also noticeable here. Wild animals, elephants, rhinoceri, deer, etc., visit this spot periodically, judging by their old and fresh tracks, probably for their saline properties, while the Sakais hold this place in great awe and veneration. They seemed quite unable to account for this phenomenon, all the explanation they could give being that they thought it was the work of "hantu." These springs are, in their geological formation, similar to those visited by me in Maliwun, Lower Burma, in Renong, Siamese Malaya, and in other parts of the Malay Peninsula; though, in point of size and importance,

they approximate those of Ojigoku in the Hakone district of Japan.

I feel here tempted to say a word in regard to this little-known district of Ulu Jelai. Doubtless for services rendered, the whole of this district has been assigned, or rather alienated by the Pahang Government to the Datoh Maharaja Puba of Jelai, otherwise and better known as the Toh Raja Jelai, who alone has the right to exploit it. With the exception of a dozen Malays, dependents of Toh Raja, who live at a place called Kwala Betok, the furthest Malay outpost up the Jelai, this district is inhabited exclusively by Sakais. These Sakais plant hill paddy for the Toh Raja and tapioca root for themselves, and do in consequence much unnecessary destruction to valuable timber forests. The ten or a dozen Malays at Kwala Betok have established a kind of an octroi or tithe station, where they exact from the Sakais their pound of flesh for the privilege of cultivating Toh Raja's land, though, to do the Sakais justice, they try by all kinds of subterfuge to evade the payment of these dues—a case of "diamond cut diamond." These Malays will tell you that the Sakais are cunning, unreliable and great cheats; while the Sakais, on the other hand, will tell you that the Malays are hard task-masters, are cruel and merciless—a case again of the "pot calling the kettle black." Taken all in all, this district is fairly rich in economic and mineral products. Rattans are plentiful, and so is Kayu Gaharu (*Aquilaria Malaccensis*) in a lesser degree, while Gutta of almost every description abounds, Gutta Rambong (*Ficus Elastica*) growing wild in places. Of minerals, gold is known to exist; indeed, I have only just located two lodes, which I have my reasons to hope may eventually pay to work. On the Betok, a stream which takes its rise in Ulu Lipis, and which drains into the Jelai at the aforesaid Kwala Betok, having an equal volume of water with the latter stream, tin ore is extremely plentiful and easy to work; so much so, that there is reason to believe that before long a very thriving mining centre will spring up in this corner of the Jelai. The Jelai River, in its upper reaches, abounds in gorges and rapids, formidable obstructions to navigation, thus nullifying its utility as a highway. To those who are venturesome, a descent in bamboo rafts affords exciting experiences.

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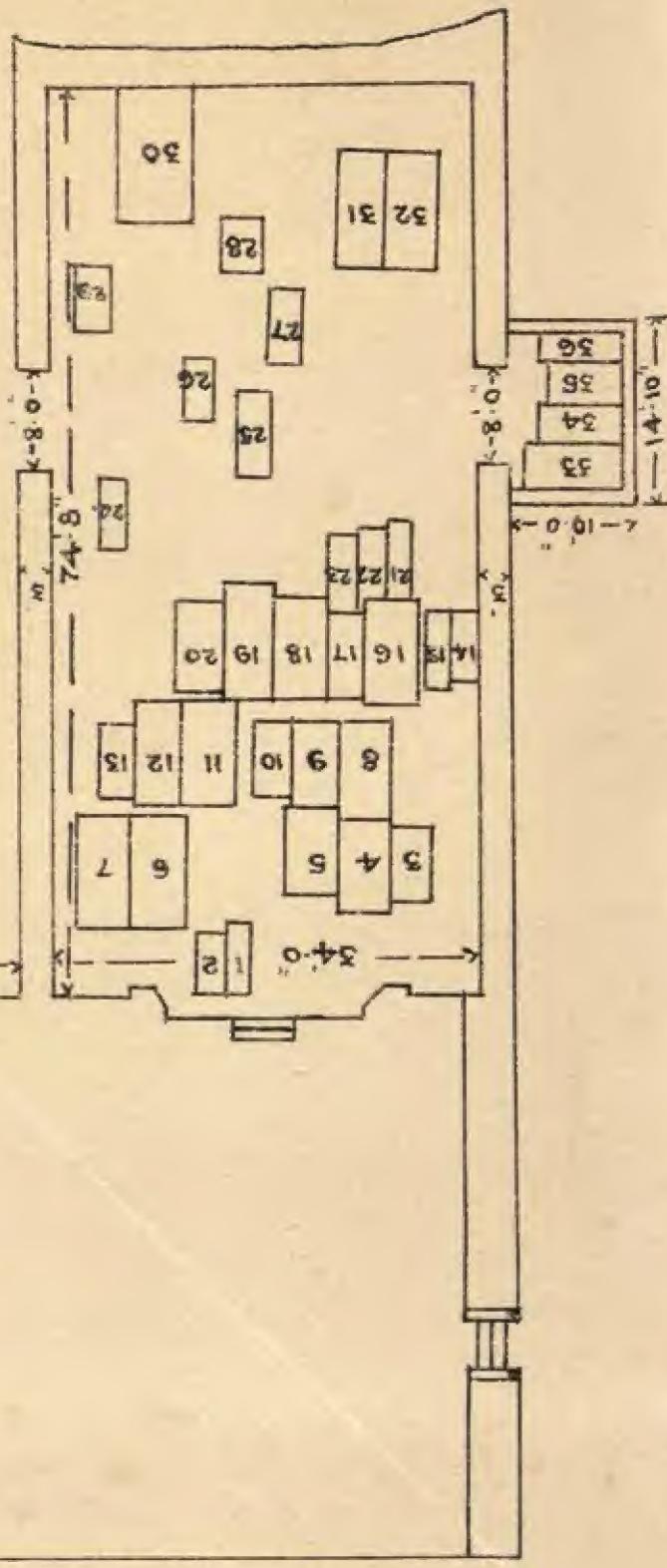
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PLAN SHEWING POSITIONS OF TOMBS  
IN OLD RUIN ON ST PAUL'S HILL

SCALE OF 16<sup>2</sup> INCHES TO 60 FEET.



## Inscriptions in St. Paul's Church, Malacca.

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The inscriptions on the tomb-stones in the old church of St. Paul at Malacca are of considerable antiquity, the dates ranging from A.D. 1568 to the early part of the eighteenth century, and are of no little interest to the student of the past history of the Settlement.

In some cases, the lettering of the inscriptions and the outlines of the coats of arms are as fresh and sharply-defined to-day as they were on the day when they were first cut. In other cases, on the contrary, the inscriptions are either entirely illegible, or can only be deciphered with difficulty. I therefore seized the opportunity afforded by a temporary residence in Malacca to make copies of all the inscriptions which are still legible, with a view to placing them on record in the journal of the Society, before time and the action of the weather have wrought any further havoc among them.

Curiously enough, while I was engaged in this work, the Acting Col. Chaplain (Mr. J. Hardy) discovered among the old Dutch records a list of the inscriptions on the tomb-stones made in 1713 by one Michiel de Bruyn, the Sexton, which was of considerable use to me in deciphering some of the more illegible inscriptions. The list is not complete, however, as the worthy Sexton left the Portuguese inscriptions and some of the Dutch ones, which are difficult to decipher, severely alone. A translation of the document is annexed (C).

I have drawn up a list of the inscriptions in brief (A), giving the names and the dates of birth and death, and I also give the inscriptions in full (B), with a translation of each in parallel columns. I further had a plan of the church made, showing the positions of the different stones, which are marked with numbers corresponding to those in the list of inscriptions.

## 2 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

Another Dutch document found in Malacca, of which I give a translation (D), shows that at one time there were a good many coats of arms hanging on the walls of the church, but these have all disappeared.

A few stones, which were lying about loose, were removed several years ago by Mr. D. F. A. Hervey, late Resident Councillor Malacca, to the present Protestant Church (Christ Church) at Malacca, where they still remain. The inscriptions on these are, however, almost entirely illegible.

In concluding these few remarks, I desire to acknowledge the great assistance rendered to me by the late Mr. P. Nuy, Librarian of the Malacca Library, and formerly a member of this Society, in deciphering the inscriptions on the tomb-stones. The two Portuguese inscriptions (Nos. 1 and 24) were deciphered and translated by Mr. H. I. Noronha.

*E. M. Merewether*

Singapore, March, 1900.

## A.

## List of Inscriptions on the Tomb-stones in St. Paul's Church, Malacca.

1. Pinto da Fonsequa, d. 27th Sept., 1635.
2. Portuguese. Almost entirely illegible.
3. Daniel Massis, b. 21st June, 1658, d. 19th Feb. 1660; and Sophia Massis, b. 21st June, 1664, d. 11th Nov., 1665 (Probably children of Johan Massis.\*)
4. Maria Noelmans, wife of Theodorus Zas, d. 14th March, 1660.
5. Hendrik Schenkenbergh\*, Opperkoopman, d. 29th June, 1671.
6. Maria Bort, wife of Nicolaes Müller, Onderkoopman, b. 5th Aug., 1639, d. 25th Aug., 1661.
7. Balthasar, infant son of Mathaeus Sonmans and Johanna Rycke, d. 3rd Aug., 1667. Also Johanna Rycke, b. 2nd Feb., 1655, d. 25th Jan., 1673.
8. Mons. Gillis Syben, d. 27 Aug., 1663, and his wife Anna Odame, d. 6th July, 1669.
9. Reynier d' Dieu, Opperkoopman, d. 17th July, 1655.
10. Johanna van Twist, daughter of Johan van Twist,\* first Governor, d. 12th June, 1644.
11. Manuel Dumoulin,\* Opperkoopman and Sabandar d. 25th July, 1660.
12. No name—3 persons, probably brothers.

NOTE.—The names marked with an asterisk will be found in the list of Dutch Officials given in Journal No. 13, pp. 55-61.

4 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

13. Hendrick van Eeckel, Opperkoopman, b. 20th March, 1619, d. 7th July, 1650.
14. Davidt Walravens, b. 18th Sept., 1623, d. 28th May, 1645.
15. Valerius van Gisteren, b. 19th May, 1614, d. 22nd April, 1646 (? 1664).
16. Theodorus Herbers, d. 18th April, 1659.
17. Partly illegible. No name.
18. Maria Quevelerius, wife of Joan van Riebeck,\* Governor b. 20th Oct., 1629, d. 2nd Nov., 1664.
19. Johanna Dumoulin, wife of Balthasar Bort,\* Governor, b. 19th May, 1653, d. 17th March, 1676. (Probably daughter of Manuel Dumoulin—see No. 11.)
20. Johan Wilhem van ——, d. 26th Nov., 1655.
21. Anganeta Robberts, wife of David Verdonek, d. 26th Feb., 1652.
22. Pieter Pietersen, Deacon, d. 27th May, 1644.
23. Maria van Vliet, daughter of Jeremias van Vliet,\* second Governor of Malacca, d. 12th June, 1650.
24. Ricardo Gonsalves (?) and Magdalena Trinidade, his wife, d. 29th March, 1568.
25. Dominus Petrus, Order of Jesuits, second Bishop of Japan, d. at Singapore, Feb. 1598.
26. Agneta Trip, wife of Arnold van Alsem.\* Stone erected 14th Feb., 1697.
27. Matthys Jansen, d. 5th Feb., 1673.
28. Sabandar Pedel (?).
29. Nicolaus Basly, d. 9th April, 1678.

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 5

30. Tablet. Major Ferrier, 48th Reg't M. N. I., Resident Councillor of Malacca, b. 14th Nov., 1811, d. 24th July, 1854.
31. Theodorus van de Kerckhoven, d. 5th Nov., 1660.
32. Johan van Zyl—Opperkoopman and Fiscaal,\* d. 3rd Jan., 1656.
33. Constantyn Johannes Rooselaar, son of Pieter Rooselaar,\* Governor and Director of Malacca, b. 13th July, 1703, d. 18th Jan., 1707. Also, Sophia Huigelbosch, wife of Pieter Rooselaar, b. 24th March, 1674, d. 9th March, 1709.
34. Francisca Barber, wife of Capt. James Barber, d. 10th Sept., 1695.
35. George Cooke, d. 6th Sept., 1712.
36. Hendrick Evertsen, d. 22nd Jan., 1698.

6 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

B.

No. 1.

S DE AN<sup>o</sup> PINTO DA  
FONSEQVA COMENDA-  
DOR DA ORDEM DE SAN-  
TIAGO PROVEDOR GERAL  
QUE FOI DAS FORALEZAS  
DA INDIA CAPIAM GERA  
DE MAR E TERRA NAS  
PARTES DO SUL FALECEO  
AOS 27 DE SEZEMBRO DE  
1635.

Sepultura de Antonio Pinto da Fonsequa Commandador da Ordem de Sam Tiago Provedor Geral que foi das Fortalezas da India Capitam Geral de Mar e Terra nas partes do Sul Faleceo aos 27 de Dezembro de 1635.

Grave of Antonio Pinto da Fonsequa, Commander of the Order of Sam Tiago formerly Commissary-General of the Forts of India, Captain-General of the Sea and Land in Southern Parts, who died on the 27th December, 1635.

No. 2.

DE ZIEL VAN D'EERSTE  
SOON EN DOCHTER NAM GOD  
MEDE NAAR'S HEMEL'S  
THROON EN LIET HAAB LICH-  
AEM HIER BENEDE.

The souls of the first son and daughter God took to heaven's throne, and left their bodies here below.

No. 3.

HIER ONDER LEGGEN BE-  
GEAVEN DANIEL MASSIS,  
DE LONGSTE GEBOREN DEN  
21<sup>o</sup> JUNY 1658 GESTORVEN  
DEN 19<sup>o</sup> FEBRARY 1660 EN  
SOPHIA MASSIS, GEBOREN

(Arms.)

Hereunder lies buried Daniel Massis the younger, born the 21st June 1658, died the 19th Feb. 1660, and Sophia Massis, born the 21st June 1664 and died the 11th November 1665.

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 7

DEN 21<sup>st</sup> JUNY 1664 EN GES-  
TORVEN DEN 11<sup>th</sup> NOVEMBER  
1665.

No. 4.

(Arms.)

HIER ONDER LEYT BEGRA-  
VEN MARIA NOELMANS HUIS-  
VROUW VAN DE THEODORI-  
JUS ZAS PREDICANT IN MALA-  
CCA GODSALICHLYK IN DES  
HEERE ONTSLAPEN DE 14<sup>th</sup>  
MAERT A<sup>o</sup> 1660.

Hereunder lies buried Maria  
Noelmans, wife of Theodorus  
Zas, Minister at Malacca, who  
piously fell asleep in the Lord  
on the 14th March 1660.

No. 5.

(Arms.)

HIER LEYT BEGRAVEN  
HENDRIK SCHENKENBERGH  
IN SYN LEVEN OPPER-  
COOPMAN EN TWEEDE PER-  
SOON DER STAD EN FORT-  
RESSE MALACCA. OVERLE-  
DEN DEN 29<sup>th</sup> JUNY 1671.

Here lies buried Hendrik  
Schenkeubergh, in his life  
Chief Merchant and Second  
Personage of the Town and  
Fortress of Malacca. Died the  
29th June 1671.

No. 6.

(Arms.)

HIES ONDER LEYT BE-  
GRAVEN JUFF—MARIA BORT  
GEWESENE HUYSVROUWE  
VAN NICOLAES MULLER  
ONDERCOOPMAN EN WINCK-  
ELIER ALHIER GEBODREN  
BINNEN Amsterd<sup>m</sup> A<sup>o</sup> 1639  
den 5 Augusty, en GODSA-  
LICHLYK IN DEN HEERE ONT-  
SLAPEN DEN 25 Aug: A<sup>o</sup>  
1661 OUT ZYNDE 22 Jaeren  
En 20 Dagen.

Hereunder lies buried Mrs.  
Maria Bort, who was the wife  
of Nicolaes Müller, Under-  
Merchant and Warehouse-keep-  
er here. Born at Amsterdam  
the 5th August 1639 and pious-  
ly fell asleep in the Lord the  
25th August 1661, aged 22  
years and 20 days.

## 8 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

No. 7.

HIER LEYT BEGRAVEN  
BALTHASAR SONMANS EEN-  
IGSTE SOONTJE VAN MA-  
THIEUS SONMANS EN JOHAN-  
NA RYCKE, GEBOREN DEN 30<sup>th</sup>  
JULY 67, EN GESTORVEN  
DEN 3<sup>rd</sup> AUGUST DESSELFDEN  
JAERS.

HIER LEYT BEGRAVEN JO-  
HANNA RYCKE HUISVROU  
VAN MATHIEUS SONMANS  
EENIGSTE DOCHTER VAN IS-  
AACK RYCKE EN MARIA  
BORT. GEBOREN DEN 2<sup>nd</sup> FE-  
BRUARY 1655, EN GESTOR-  
VEN DEN 25<sup>th</sup> JANUARY 1673.

(Arms).

Here lies buried Balthasar Sonmans, only son of Mathaeus Sonmans and Johanna Rycke, born the 30th July, '67, and died the 3rd August of the same year.

Here lies buried Johanna Rycke, wife of Mathaeus Sonmans, only daughter of Isaack Rycke and Maria Bort, born the 2nd February, 1655, and died the 25th January, 1673.

No. 8.

WIEN ECHTE HOYLUX  
BANDT GEBONDEN HAD AEN  
EEN RUSTEN OOK BY  
MALKAER HIER ONDER DE-  
SEN STEEN.

Those whom the bond of  
marriage had joined together  
in one, rest also by one another  
under this stone.

(Arms.)

HIER LEGGEN BEGRAVEN  
MONS<sup>r</sup> GILLIS SYBEN GE-  
BOORTICH VAN HAERLEM IN  
SYN LEVEN OPPEROOPMAN  
EN SECUNDE PERSON, AL-  
HIER GESTORVEN DEN 27<sup>th</sup>  
AUGUST—1663, EN DE SYN  
HUISVROUW ANNA ODAME  
UIT SCHRAVENHAGE GES-  
TORVEN DEN 6 JULY 1669.

Here lies buried Mons'r Gillis Syben, born at Haerlem, in his life Chief Merchant and Second Personage, died here the 27th August 1663, and his wife Anna Odame of Schravenhage, died the 6th July, 1669.

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 9

No. 9.

HIER ONDER LEYT BEGRAVEN REYSIER D'DIEU  
IN SYN LEVEN OPPEROOPMAN IN DIENST DER E.  
COMP<sup>N</sup> OVERLEDEN DEN 17<sup>TH</sup>  
JULY A<sup>o</sup> 1655.

Hereunder lies buried Reyner d' Dieu, in his life Chief Merchant in the service of the Honourable Company. Died the 17th July, 1655.

No. 10.

HIC IACET	TWIST
VAN	OMA
PRIM	
MAL	ATOR
OVIT	
AN	164
ÆTATIS SVÆ DECM	

*Note.* This inscription is incomplete, and it is not in Michiel de Bruijn's list; but it is probably the tomb of Johanna van Twist, daughter of Johan Van Twist, first Governor of Malacca (1641-1642). She is mentioned in the list of coats of arms as having died on the 12th June, 1644. (See No. 10.)

No. 11.

HIER LEYT BEGRAVEN  
Manuel Dumoulin, IN SYN LEVEN  
OPPERCOOPMAN EN SA-  
BANDAER DER STADT MA-  
LACCA GEBOOREN IN 'T  
JAAR 1620 DEN 5 DECEMBER  
EN GODSALICHLYK IN DEN  
HEERE ONTSLAPEN DEN 23  
JULY A<sup>o</sup> 1660 OUT ZYNDE  
39 JAER EN 7 Maenden.

(Arms.)

Here lies buried Manuel Dumoulin, in his life Chief Merchant and Harbour Master of the town of Malacea, born the 5th December 1620, and piously fell asleep in the Lord the 25th July 1660, aged 39 years and 7 months.

No. 12.

DRIE DIE NATUUR EEN  
HUIS EN'T SAMEN WONING  
GAF DIE LEGGEN HIER  
BYEEN BESLOTEN IN DIT  
GRAF.

Three to whom nature gave one house and joint dwelling now lie here together enclosed in this tomb.

10 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

OBYT	$\left\{ \begin{array}{l} 1647 \\ 29 \text{ DECEMBER} \\ 25 \text{ FEBRUARY} \\ 19 \text{ MARTY} \\ 1660 \end{array} \right\}$	AN*	$\left\{ \begin{array}{l} 1647 \\ 29 \text{ December} \\ 25 \text{ February} \\ 19 \text{ March} \\ 1660 \end{array} \right\}$	Obiit	$\left\{ \begin{array}{l} 1647 \\ 29 \text{ December} \\ 25 \text{ February} \\ 19 \text{ March} \\ 1660 \end{array} \right\}$	AN*
------	--	-----	--	-------	--	-----

(Arms.)

DEN GAFFEL-BOYER IS  
ONS GROOTVADERS EERSTE  
VOND TONS VADERS EERSTE  
HUIS NU SLUYT SE ONS  
DE MONDT.

The "gaffel-boyer"\*\* is our grandfather's first discovery. Our father's first house now closes our mouths. (The meaning of this is not clear).

No. 13.

HIER LECHT BEGRAVEN  
HENDRICK VAN EECHEL  
GEBOREN TOT AMSTERDAM  
IN 'T JAER 1619 DEN 20<sup>e</sup>  
MAERT BY SYN LEVEN OP-  
PERCOOPMAS EN HOOFT DES  
NEDERLANDSZ=COMPTOIR  
LIGOOR OVERLEDEN DEN  
7 JULY A<sup>r</sup> 1650.

Here lies buried Hendrick Van Eeckel, born at Amsterdam the 20th March 1619 : in his life Chief Merchant and head of the Netherlands factory at Ligor. Died the 7th July 1650.

No. 14.

HIER LEIDT BEGRAVEN  
DAVIDT WALRAVENS GE-  
BOREN DEN XVIII SEPTEM-  
BER AN<sup>r</sup> MDCXXIII EN IN  
DEN HEERE ONTSLAPEN  
DEN XXVIII MAY MDXXXXV.

(Arms.)  
Here lies buried Davidt Walravens, born the 18th September 1623, and fell asleep in the Lord the 28th May 1645.

No. 15.

HIER LEYT BEGRAVEN VA-  
LERIUS VAN GISTEREN

(Arms.)  
Here lies buried Valerius van Gisteren of Amsterdam, Chief-

\* An old-fashioned Dutch vessel.

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. II

VAN AMSTERDAM OPPER-  
KOOPMAN GEBOREN A N°  
MDCXIV DEN XIX MAY IS IN  
DEN HEERE ONTSLAPEN  
DEN XXII APRIL A° MDCXLVI.

Merchant, born the 19th May  
1614, fell asleep in the Lord  
the 22nd April 1646.

No. 16.

(Arms.)

HEIC SEPULTVS THEODO-  
RVS HERBERS G F : OBYTT :  
ETATIS NONO A° J659 : J8 :  
April.

Here (lies) buried Theodorus  
Herbers. Died in the 9th year  
of his age, 18th April 1659.

No. 17.

(Arms.)

DE GAFFEL  
BOYER IS NYIS (ONS?)  
GROOTE VADERS VOND  
(ONS?) VADERS EERSTE  
HYIS KV SLVYT SE  
(ONS DE?) MOND

Note. This part of the in-  
scription is incomplete, but it  
seems to be almost identical  
with the latter part of No 12.

(Arms.)

GRAF DICHT  
HIER LEIDT DES  
MOEDERS VREUCHD  
EN VADERS EERSTE  
STAM DIE OP DE  
SELFDE DAG BEGIN  
EN EYNDE NAM

Close grave.  
Here lies the mother's joy  
and father's first off-shoot,  
which on the same day had  
beginning and ending.

No. 18.

HIC JACET SEPULTA MA-  
RIA QUEVELERIUS UXOR IL-  
LUST—D' JOANNES A RIE-  
BIECK PRIMI COMMENDATORIS  
ET FUNDATORIS ARCGJS  
ET COLONIE IN PROMON-  
TORIO BONA-E-SPEI IN AFRICA  
SUB DITIONE SOCIETATIS  
INDIA (E) ORIENTALIS NUNC-  
COMMENDATORIS ET PRESI-

Here lies buried Maria Que-  
velerius the distinguished wife  
of Johannes Riebeck, first Com-  
mander and founder of the fort  
and colony on the Cape of Good  
Hope in Africa, under the rule  
of the East India Company, now  
Commander and Governor of  
the city and province of Malacca,  
born at Rotterdam 20th

## 12 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

DIS CIVITATIS ET DITIONIS  
MALACENCIS NATA ROTTER-  
DAMI A. D. MVIXXIX OC-  
TOBER XX DENATA NOVEM-  
BER II-XVILXIV.

October, 1629, died 2nd November, 1664.

WIEN ROTTERDAM H E T  
LICHT LEYDEN QUE (?) SEDEN  
GAF WIENS T R O U D A Q R  
HIELT SCHIEDAM LEYT HIER  
NU IN DIT GRAF.  
IMWERTM.

(Arms.)

She to whom Rotterdam gave  
the light and Leyden education,  
whose wedding was celebrated  
in Schiedam, lies here now in  
this tomb.

No. 19.

Ter Gedachtenisse van Juf-  
rouw Joanna Du Moulin Huys-  
vrouw van de Heer Balthasar  
Bort Raedt Extraordinaris van  
India Gouverneur en Directeur  
der Stadt en Porteresse MA-  
LACCA Overleden den 17<sup>e</sup> Meert  
1676.

To the memory of Mrs. Jo-  
anna Du Moulin, wife of Heer  
Balthasar Bort, Councillor Ex-  
traordinary of India, Governor  
and Director of the town and  
fortress of Malacca. Died the  
17th March, 1676.

Joanna du Moulin rust onder  
desen Steen die vroech al toen  
se Juist twee Maenden en twee  
dagen min drie en twintich  
Jaer had 's werelts pad bet-  
reën, d'onsterfelyke Ziel quam  
Gode op te dragen ten uijterste  
gerust Getroost in God's be-  
drijf gevoelde sij geen smert  
in't scheiýden uit het lijf.

(Arms.)

Joanna Du Moulin rests un-  
der this stone, whose immortal  
soul, when she had trodden  
this world's path just two  
months and two days less than  
23 years, God came and bore  
away to its last rest. Submis-  
sive to God's will, she felt no  
pain in parting from the body.

No. 20.

JOHAN WILHEM VAN ——  
IN ZYN LEVEN KAPES DE-

Johan Wilhem Van ——  
in his life Captain of this garri-

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 13

ZES GARNIZ<sup>NS</sup>. OVERLEDEN  
DE 26 NOV<sup>RS</sup> A<sup>O</sup>. 1655 LEGT  
HIER BEGRAVEN.

son. Died t'he 26th Nov., 1655,  
lies buried here.

No. 21.

HIER LECHT BEGRAVEN  
ANGANETA ROBERTS ALMA  
HUYSVOORWE VAN DEN COOP-  
MAN DAVID VERDONCK  
OVT 29 IAREN STERFDE DEN  
6 FEB. A. 1652.

Here lies buried Anganeta  
Roberts, venerated wife of the  
merchant David Verdonck, aged  
29 years, died the 6th Feb.,  
1652.

No. 22.

HIER LECHT BEGRAVEN  
PIETER PIETERSEN VAN EN-  
CHUYSSEN, IN SYN LEVEN  
GRANG BESOECKER EN DE  
DIAKEN DER KERKE GESTOR-  
VEN 27 MEY ANNO D 1644.

Here lies buried Pieter  
Pietersen of Enchuyzen, in his  
life visitor of the sick and  
Deacon of the Church. Died  
27th May A. D. 1644.

No. 23.

HIER LECHT BEGRAVEN  
(Maria van) VLIET (Dogter)  
VAN (Jeremias van) VLIET  
TWEED GOUVERNEUR (VAN)  
MALACCA GESTORVEN XII.  
(Juny) AN<sup>O</sup>. MDCXLIV.\*

(Woman's Arms.)  
Here lies buried (Maria Van)  
Vliet, (daughter) of (Jeremias  
van) Vliet, second Governor  
(of) Malacca, died the 12th  
(June) 1644 (?)

No. 24.

ESTA SEPVLTRA E DE  
RCOGL (?) HE DE MADANELA  
TI (?) NAD A SVA MOHER QVE  
POI MORDOMO D' ESTA CASA  
DE NOSSA SNRA MADRE DE  
DEOS MVITOS ANOS HO QVAL

\* The inscription on this stone is incomplete, but I have filled it in from the copy in Michiel de Bruyn's list. There is some doubt about the date, but as J. Van Vliet was Governor from 1642 to 1645, it is probably correct.

## 14 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

FALECEO AOS 29 DE MARCO  
D 1568 ANOS.

PATER NOSTER.

Esta sepultura é de Ricardo Gonsalves e de Magdalena Trindade (sua mulher) que foi Mordomo d'esta casa de Nossa Senhora Madre de Deos muitos annos o qual faleceo aos 29 de Março de 1568 annos.

Pater Noster.

HIC JACET DOMINUS  
PETRUS SOCIETATIS IESU  
SECUNDUS EPISCOPUS JAPONENSIS  
OBIIIT AD FRETUM  
SINGAPURE MENSE FEBRUA-  
RIO ANNO 1598.

D. O. M.

PIAEQUE MEMORIAE AGNETAE  
TRIP UXORIS CASTAE  
FOECUNDÆ DILECTÆ.

HOC MONUMENTUM PT.  
(Posuit) ARNOLD VAN ALSEM,  
FISCI ADVOCATUS 14 KAL<sup>o</sup>  
FEBRURY MDCXCVII.

HIER ONDER LEIGHT BEG-  
RAVEN MATHYS JANSEN VAN  
THONDEREN VRYBORGER.  
IS OVERLEDEN DEN 5<sup>TH</sup> FEB-  
RUARI ANNO 1673.

This is the grave of Ricardo Gonsalves and of his wife Magdalena Trindade, who was for many years Majordomo of this House of Our Lady, Mother of God, and who died on the 29th of March of the year 1568.

Pater Noster.

No. 25.

Here lies Master Peter of the Order of Jesus, Second Bishop of Japan. Died at the Strait of Singapore in the month of February, 1598.

No. 26.

D. O. M.

And to the pious memory of Agneta Trip, chaste, fruitful, and beloved wife.

(Arms.)

This monument was erected by Arnold van Alsem,\* Advocaat Fiscaal. 14th February, 1697.

No. 27.

Hereunder lies buried Mat-  
hys Jansen of Thonderen, free  
citizen. Died the 5th Febru-  
ary 1673.

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\* See Journal No. 13 p. 58.

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 15

No. 28.

*Note.* There is no inscription on this tomb, and apparently there never has been any, except the two lines at the foot.

DUSVERRE STRECKT HET  
GRAF VAN DEN SABANDAAR  
PEDEL.

Thus far extends the tomb  
of the Harbour-master Pedel.

No. 29.

HIER ONDER LEYT BEGRA-  
VEN NICOLAUS BASLY, IN  
SYN LEVEN VRYBORGER  
OBYT DEN 9<sup>e</sup> APRIL A<sup>o</sup> 1678.

Hereunder lies buried Nicolaus Basly, in his life a free citizen. Obiit 9th April 1678.

No. 30.

SACRED  
TO THE MEMORY OF  
MAJOR FERRIER  
(OF BELSIDE)  
48<sup>TH</sup> REG<sup>T</sup> M. N. I.  
AND RESIDENT COUNCILLOR  
OF MALACCA. HE WAS BORN  
IN SCOTLAND 14<sup>TH</sup> NOVR  
1811. DIED AT PRINGIT IN  
MALACCA 24<sup>TH</sup> JULY 1854.  
THIS TABLET IS ERECTED BY  
HIS WIDOW.

No. 31.

HIEB ONDER DESEN STEEN UYTGELOVEN  
LEGH'T THEODORUS VAN DE KERCKHOVEN  
IN SYN LEVEN WAS HY VADER'S  
EN MOEDER'S VEEUGT  
SYN BROEDER LEEFDE HY  
TOT EEN GENEUGT  
EEN JAER MIN DRIE DAGEN

## 16 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

WAS DESE SPROUT  
DOEN GOD DE ZEL DEED GÆN  
HET LIGHAEM UIT  
EN OFTER NAE SYN UIT VÆRT  
YEMANT VROEG  
NOVEMBER VYP MEN HEM  
TER ADREN DROEG  
IN'T JÆR SESTEN HONDERT  
EN SESMAEL THEN  
BINNEN DE STAT MALACCA  
SAG MENT GESCHEN.

Here in the hollow under this stone lies Theodorus Van de Kerckhoven. In his life he was his father's and mother's joy : he loved his brother dearly. One year less three days was this tender plant when God caused the soul to leave the body : and frequently after his interment people asked about him. On the 5th November in the year sixteen hundred and six times ten (1660) was he borne to earth : in the town of Malacca was the occurrence seen.

### No. 32.

(Arms.)

HIER-ONDER LECHT BEG-  
RAVN JOHAN VAN ZYL  
GEBORTICH VAN VYANEN  
IN SYN LEVEN OPPEROOP<sup>M</sup>  
EN FISC<sup>E</sup> DESER STFDE  
OVERLEDEN DEN 3<sup>RD</sup> JANUARY  
1656.

Hereunder lies buried Johan  
Van Zyl, born at Vyjanen, in  
his life Chief-merchant and Fis-  
caal of this town. Died the  
3rd January, 1656.

### No. 33.

(Arms.)

HIER RUST CONSTANTYN  
JOHANNES ROOSLAAR  
Zoontje van den E. E. ACT-  
BAREN HEER PIETER ROOSE-  
LAAR Raad Extraordinair van  
INDIA Mitsgaders GOUVER-  
NEUR EN DIREUTEUR deser

Here rests Constantyn Johannes Rooselaar son of the very  
honourable Heer Pieter Rooselaar, Councillor Extraordinary  
of India, also Governor and Director of this town and fort-  
ress of Malacca. Born the 13th

INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 17

STAD EN FORTRESSE MALACA. GEBOREN den 13<sup>e</sup> July Anno 1703 en OVERLEDEN den 18<sup>e</sup> JANUARY 1707.

Alsmede MEVROUWE SOPHIA HUIGELBOSCH gewesene waerde Gemalinne van opgemelde Edele Heer PIETER ROOSLAAR Geboren binnē de Stad ROTTERDAM op den 24<sup>e</sup> MAART Ao 1674 en in 't Kraambedde Overleden den 9<sup>e</sup> Maart Anno 1709.

July 1703, and died the 18th January, 1707.

Also Mevrouwe Sophia Huijgelbosch, who was the beloved wife of the said noble Heer Pieter Rooselaar, born in the town of Rotterdam on the 24th March, 1674, and died in child-birth the 9th March, 1709.

No. 34.

Francisca Barber Cap. Jacobi Barber UXOR pientissima Mari-tum e Bombaya insula Chinam profectum ultro Comitata ad banc Malaccam jam gravida mansit Ubi exacto gravidarum termino Dum frustra Batavi Genus Hospitale Hospitis vitae salutique student prius quam levata est fatali onere sub onus succubuit Decimo Die Septembris 1695.

Francisca Barber, most pious wife of Capt. James Barber, who accompanied her husband on his way from the Island of Bombay to China, being great with child, remained here at Malacca : where, when the period of her pregnancy was complete, while the hospitable Batavian people vainly laboured for the life and safety of their guest, before she was relieved of her dread burden she sank beneath its weight, on the 10th day of September 1695.

No. 35.

Vivere Caelicolis terrae tentoria liqui. Vita labor fuerat; Mors Mihi vita fuit.

To dwell with the heavenly host earth's tents I left. My life had been a toil; death to me was life.

In certa et constanti spe Resurrectionis hic positio sunt exuviae GEORGII COOKE quodam

In sure and certain hope of the resurrection, here are laid the remains of George

## 18 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA.

Navis Hoivladise Capitanei Vir  
Probitate Proelclarus Fidelitate  
Insignis et variis Scientiis proe-  
ditus in reditu a China Obiit 16  
Septembris Anno Salutis nos-  
tre 1712 Et Aetatis sue 36.

Cook, formerly Captain of a Dutch vessel. A man distinguished by his uprightness, renowned for his trustworthiness and endowed with various kinds of knowledge, he died on his way back from China on the 16th September in the year of our salvation 1712, and in the 36th year of his age.

No. 36.

HIER LEYD BEGRAVEN  
HENDRICK EVERSEN in syn  
LEEVEN BORGER CAPT. en  
VRYKOOPMAN Alhier Obiit  
22 JANUARY 1698 out 52 JA-  
AREN.

Here lies buried Hendrick Evertsen, in his life Citizen, Captain and free Merchant here, Obiit 22nd January, 1698, aged 52 years.

## C.

Report made by the undersigned sexton, Michiel de Bruyn, to the honourable Heer Anthony Hansius, Chief Merchant and second personage (of Malacca), likewise first Churchwarden of this Government, regarding the inscriptions which are engraved on the stones in the Church of St. Paul on the hill, and correctly recorded as follows hereunder, to wit.

(Here follow inscriptions Nos. 3, 4, 5, 6, 8, 9, 11, 12, 16, 18, 20, 21, 22, 23, 27 and 29).

Malacea, 17th March, A<sup>o</sup> 1713.

(Sd) M. de BRUYN.

## D.

List of the Coats of Arms hanging in the Church of  
St. Paul, within this fortress of Malacca.

1. On the right side of the pulpit, in a frame with ornaments :—

The arms of the very honourable Heer FREDRICK GOBIUS, in his life Governor and Director of this town and fortress.

Died the 13th October, A<sup>o</sup> 1730.

2. Over the pew of the Honourable Council of Police,\* in a frame :—

The arms of Mevrouw SOPHIA HUYCHELBOSCH,† in her life wife of the Right Honourable Pieter Rooselaar,‡ Councillor Extraordinary of Netherlands India, likewise Governor and Director of this town and fortress.

Died the 9th March, A<sup>o</sup> 1709.

3. Thereafter follow, over the same pew, in a frame with ornaments :—

The arms of the very honourable Heer THOMAS SLICHER,‡ in his life Governor and Director of this town and fortress.

Obiit 18th October, A<sup>o</sup> 1691.

4. Beside the above follow, between the said pew and that of the Chief Citizens' Company, without a frame :—

The arms of the gallant Military Captain JAN CHRISTOFFELMOM. Died the 25th September (written "7-ber") 1736.

5. Thereafter follow, over the last-mentioned pew, without a frame :—

\* In the original "Raad Van Politie." This may mean either a Police Council or Commission, or a person holding the office of Police Commissioner; just as a Member of the Council of Netherlands India is spoken of as "Raad Van India."

† See No. 33, in the list of inscriptions.

‡ See Journal No 13, p. 56.

## 20 INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA

The arms of the noble Heer GERRIT VERSCHRAGEN, in his life Chief Merchant and second (personage) of this Government. Obiit, 26th May, A<sup>o</sup> 1735.

6. Then follow further on, without a frame :—

The arms of the gallant Military Captain ADRIAAN TOOT. Obiit 23rd July, A<sup>o</sup> 1698.

7. Next hang, without a frame :—

The arms of the gallant Military Captain HENDRICK FEMMER.

Obiit 26th October, 1692.

8. Thereafter follow, towards the wall of the choir, without a frame :—

The arms of Mevrouw SUSANNA SCHRAICK, in her life wife of the very honourable Heer Carel Bolner,\* at that time the retiring Governor and Director of this town and fortress.

Obiit 4th February, A<sup>o</sup> 1707.

9. In the middle of the said wall, right over the pulpit, in a frame :—

The arms of Mevrouw ANNA WILDELAND, in her life wife of the very honourable Heer Harmanus van Suchtelen,\* Governor and Director of this town and fortress.

Obiit 21st May, A<sup>o</sup> 1725.

10. Near the above, towards the wall before mentioned, on the other side without a frame :—

The arms of the young lady JOHANNA VAN TWIST,† daughter of the very honourable Heer Johan van Twist,‡ Governor and Director of this town and fortress.

Obiit 12th June, A<sup>o</sup> 1644.

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\* See Journal No. 13, p. 56.

† See list of inscriptions No. 10.

‡ See Journal No. 13, p. 55.

## INSCRIPTIONS IN ST. PAUL'S CHURCH, MALACCA. 21

11. Thereafter follow, on the side-wall, over the seat of the Treasurer, without a frame:—

The arms of Mejuffrouw MARIA QUEVELERIUS\* in her life wife of the right honourable Johannes van Riebeck,† Commander and President here.

Obiit 2nd November, A<sup>o</sup> 1664.

12. Near the above, between the said seat and that of the last-named officer, in a frame:—

The arms of Mejuffrouw AMARENTIA KOECK, wife of the noble Heer Pieter du Quesne,‡ then Chief-merchant and second (personage) of this (place) likewise pro tempore Commander here.

Obiit 15th November, A<sup>o</sup> 1730.

13. Near the above, next the door, over the pew of the last-named officer, in a frame:—

The arms of Mevrouw JOHANNA DU MOULIN,|| wife of the noble Heer Balthasar Bort,† Councillor in Ordinary of Netherlands India, and Governor and Director of this town and fortress.

Obiit 11th March, A<sup>o</sup> 1676.

14. On the other side of the door, over the seat of the Consistory, in a frame with ornaments:—

The arms of the very honourable Heer GILMEN VOSBURG,† in his life Governor and Director of this town and fortress.

Obiit 19th February 1697.

15. On the left side of the pulpit, without a frame:—

\* The arms of the youth THEODORUS HERBERTS, son of the noble Heer Gerard Herberts, Chief Merchant and second (personage) of this Government.

Obiit 18th April 1659. Aged 9 years.

\* See list of inscriptions, No. 18.

† See Journal No. 13, p. 56.

‡ See Journal No. 13, p. 61.

† See Journal No. 13, p. 56.

|| See No. 19 in the list of inscriptions.



## A Botanical Excursion to Gunong Jerai. (Kedah Peak.)

BY H. N. RIDLEY.

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The great isolated mountain commonly known as Kedah Peak, which forms so conspicuous an object in the view from Penang, has been several times ascended by Europeans, but as far as I am aware no account of it has been published. The following description of its ascent may therefore be useful to those who intend to scale it.

I left Penang on June 4th, 1893, in the "Rosebud" launch, accompanied by Mr. Curtis, intending to make the ascent from the village of Yan, which lies at the foot of the mountain and is the best starting point, though there is another route from the Merbau river. The weather was very bad and when we had arrived opposite Yan, a heavy squall came up and we had to fly for shelter to Pulau Song-song, where the water was deep and quiet. With some difficulty, owing to the strong headwind and dense rain which completely hid the view, we managed to get under lee of the island, and shortly after the rain abated we determined as it was rather late to spend the night at Pulau Song-song, especially as the surf was breaking heavily on the coast and would make it difficult for us to land the baggage from the boats. We therefore landed on the island and took up our quarters in a native hut. The village is small and the inhabitants gain their living by catching and curing fish and by collecting turtle eggs. The island is rocky, the prevailing rock being clay ironstone with ferruginous sands and clays. It is thickly wooded with fairly large trees, among which were *Swintonia spicifera* and *Anisoptera Curtissii*, both in fruit. The former appeared very abundant and was very conspicuous on account of its masses of red-winged fruits, but the trees were too tall for us to secure good specimens. Strolling along the shore we

24 BOTANICAL EXCURSION TO GUNONG JERAL.

collected a few interesting plants, among which were *Atalantia monophylla*, forming a bushy tree loaded with its small green oranges, *Cordia Sebestena*, the iron wood tree of Cocos island, with its showy orange flowers, a pretty *Hoya* with white sweet-scented blossoms, and creeping over the sandy banks a pretty *Ruellia* with fairly large violet flowers, *R. prostrata*, not previously recorded from the Malay Peninsula nor have I ever met with it since. Orchids were not wanting on the trees by the beach. *Aerides odoratissima* seemed common and was in bud, and some fine plants were secured. It seems to have a liking for the sea shore as I have several times found it abundantly on the smaller islets in the Straits in similar localities. *Eria bractescens*, *Cirrhopetalum Medusae*, the common *Cymbidium* (*C. aloifolium*) and the pigeon orchid *Dendrobium crumenatum* were also found but were not in flower. The maiden hair fern, *Adiantum Capillus-veneris*, also grew on the rocks by the sea.

During the night a large turtle landed on the beach near the village and laid about forty eggs in the sand which were easily found next morning by the villagers, as the animal had left a large wide track like that made by pushing down a boat through the sand from its nest to the sea.

Next morning being quite fine we hastened across the Yan. The sea on this coast is very shallow and even small steam launches have to anchor a mile away at least. The mouth of the river is exactly opposite Pulau Song-song. A plantation of coconut palms runs along the coast south of the river, terminating near its mouth, and thus forms a good land mark. The river being tidal is fringed with the common tidal swamp vegetation, the commonest tree being *Aricennia*. The wild date palm, *Phoenix paludosa* is abundant, *Pluchea indica*, *Wedelia biflora* and the common *Acanthus* (*A. ebracteatus* Vahl) are also conspicuous. This latter plant has a great reputation in Penang as a medicine for boils. The seeds are roasted, pulverised and mixed with water, and the liquid drunk. The natives state that the patient will be freed from boils for as many years as there are pounded seeds in the draught. This *acanthus* known here as Jeruju, has the flowers light blue or white, usually the latter in the south of the peninsula and blue in the north and Java, but blue flowers occur in some parts of Singapore. The large and brilliant-

flowered *A. ilicifolius*, I have only met with in the Lankawi islands; the prickly holly-like foliage is similar, but the flowers are more than twice as large, and of a beautiful blue.

The village of Yan is not visible from the sea-shore but is situated a few hundred yards from the mouth of the river, which at high water is deep enough to float good-sized tongkangs. There is another route to it through a swampy piece of ground behind the coconut plantation south of the river mouth. This swamp had apparently been under paddy cultivation but at this time was covered with a dense bed of sedges chiefly *Scirpus grossus* which is used in mat making. Among it grew the charming water balsam *Hydrocera triflora*.

The village is of fair size and there are a good many Chinese settled there who make a living by cutting timber on the slopes of the mountain and by making charcoal. Durians, Mangosteens, Rambai, Bachang and other fruit trees are largely cultivated. The Durian trees were of remarkably large size, and all day but especially in the evening and early morning one could hear the crash of the falling fruit. Squirrels seemed to be doing much damage to them and the village children were provided with pellet-bows made of bamboo and rattan, from which they discharged stones at the little animals. So famous are the Durian trees of Yan that the natives gave a half humorous derivation of the word Durian, from Deri Yan.

There were many pepper gardens in the neighbourhood and I also saw coffee, patchouli and tobacco cultivated there, but the latter seemed for the most part to be abandoned. Indigo I was told had been tried but apparently without success.

As in other native states under Siamese influence, such as Kelantan, the women are less confined to the house than in the Southern States and go about more in the villages. There was a good deal of sickness apparently and as the natives had no European medicines and knew nothing about indigenous drugs, there was an extensive levee of applicants for medical treatment every morning. Badly neglected wounds on the feet and legs from falling durians seemed to be the chief ailments.

The Penghulu Rajah, who had been forewarned of my arrival from Penang, very considerately put an empty house—the best in the village—at my disposal, assisted me to procure coolies and

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sent an armed guard to watch over the house at night while I was there, as well as a patrol who rambled about at night armed with spears and lanterns. The use of the stocks for malefactors was not abolished here, and in one house we saw a native fixed in them by one leg.

The natives recommended that I should start early in the morning for the Peak, as it rained frequently in the afternoon, so it was determined to remain in Yan for the rest of the day. Mr. Curtis returned to Penang and I occupied the time in collecting in the nearest patch of jungle, where were a number of trees hardly or not at all known to me. Among them a large Magnolia (*Talumina* sp.) with very large white fruit with pink seeds, *Straphanthus Jackianus* with its long-tailed orange flowers, a pretty *Elettariopsis* (*E. latiflora*) with white, crimson and yellow flowers, and the shrubby *Bauhinia mollissima* with red flowers, one petal of which is white and yellow, especially claimed attention. Specimens of a small tree called here Nasi Sejuk (cold rice) were brought me by the men. The branches bore a handsome fruit as large and of the same colour as a good orange. It contained several large seeds wrapped in a sweet well-flavoured pulp. The tree proved to be *Salacca flavescens*.

I secured a specimen of a small prettily marked snake with remarkably large eyes and later in the day a large black and white *Typhlops* was brought me. These were all the reptiles I saw except the common green tree snake *Tragope porcinus* and a very large tortoise which I perceived creeping along the bottom of the river in the early morning as I went down to bathe. It burrowed under the bank and I could not get it out. There were said to be no crocodiles in the river.

About three miles from Yan is a fine waterfall which is well worth a visit. The route to it follows the telegraph line towards Kedah. The fall is visible for a considerable distance out at sea. After remaining a day at Yan, I started with the coolies to ascend the mountain. Passing through a little open country interspersed with woods, one reaches the dense jungle which covers the mountain-side. A guide is necessary for at least the first part of the way, as there are many tracks made by charcoal-burners and timber-cutters, which are likely to lead the explorer astray. The lower woods would well repay a thorough botanical investi-

gation, as there seemed to be very many plants of interest, but time did not permit of a careful search. The path was strewn with fruits and seeds of various kinds fallen from the trees. At one place were innumerable fruits of the yellow flowered *Wormia metiosmaefolia*, at another those of the Minyak Kruen, *Dipterocarpus pterygocalyx*. *Melamnorhea Curtissii*, one of the trees known as Rengas, was loaded with its red-winged fruit and formed a conspicuous object. The timber of this tree was in request by the woodmen, and felled trunks could be seen lying in the wood. The heart wood is hard and dark red, and as there is much soft white sap wood, the felled logs are left on the ground till the termites have eaten off the sap wood, when the heart wood untouched by them is dragged to the foot of the hills on buffalo-sleds. *Vitis coriacea*, a small tree, was bright with its innumerable violet flowers which attracted hosts of butterflies. Leeches are rather troublesome in this part of the wood but disappeared in the higher parts of the hill. The track is an easy gradient but long and toilsome and was decided by my boy and the plant collector to be worse than that up Mount Ophir. At one spot a fine view towards the northwest is to be obtained, but otherwise the path is entirely closed in by jungle. At about 2000 feet altitude the flora suddenly changes. The trees are smaller and more slender and the ground in the more rocky spots is covered with orchids and ferns. The path traversed a thick scrub of the curious fern *Oleandra neriiformis* as high as one's head. Here and there were open grassy spots on which grew many pink-flowered Sonerilas, white Hedyotis and yellow Xyris, the latter being a new species described as *Xyris Ridleyi*.<sup>7</sup>

The turf was ploughed up at one of these grassy patches by rhinoceros, but the animals were not seen. The camping ground lies in the highest of these spots between two peaks of the range, the highest of which lying towards the south is a thousand feet above it, and is the summit of Gunong Jerai. There is a good stream of water and plenty of firewood here. The rocks consist of quartzite, sandstones, and micaceous schists and piles of stones were pointed out as relics of tin mining operations abandoned some few years previously. A little way below the camp was an outcrop of iron ore (haematite). Close to the hut were evident very recent traces of a large tiger.

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but nothing was heard or seen of the beast. Kijang were said to be common here, but none put in an appearance. On one occasion I heard in the evening the cry of a Lotong (*Semnopithecus*) but no other animals were seen or heard except one or two small bats. Birds too were very scarce and mostly small species, as at Mount Ophir. Three fine hawks passed over the camp one afternoon, but kept well out of range. Butterflies and beetles were numerous and among the latter I secured a specimen of *Odontolabis gazella* a well known Ophir insect. One of the men caught also a death's head moth, but it escaped his grasp. The flora round the camp bore some resemblance to that of Mount Ophir, many of the trees being of the same kinds : such were the Conifers, *Dammaria orientalis*, *Ducrydium elatum* and *Podocarpus cyparissinus*; as also *Tristania meruegensis*, *Boekzia frutescens* and *Leptospermum amboinense*. The wild Aniseed, *Ilicium Cambodianum*, with rosy or white flowers and star like capsules, resembling those of the true Star anise of Cochin China but quite odorless, was plentiful in the woods, but the most striking shrub was a beautiful white *Rhododendron* about twelve feet tall which bore bunches of large white flowers with a yellow centre. A plant well worthy of cultivation, but unfortunately neither seeds nor young plants could be obtained.

Among the smaller plants a charming little sonerila with mauve rarely white flowers, and leaves of every shade of green olive and purple frequently spotted or marbled with white was very abundant. Botanically it was especially interesting from its possessing a tuberous root. *Burmannia disticha* was unusually abundant and fine, both in size and color. One plant was gathered with twenty-six flowers in a head, and growing in masses as it does here its beautiful blue flowers reminded one of the blue hyacinths of the English woods. Another pretty blue flowered plant was a tall grassy leaved *Anellemus* (*A. giganteum* Br.) which opened its azure flowers only at noon. It was hitherto unknown from the peninsula, though of very wide distribution, occurring in Africa, India, Ceylon, the Malay islands, China and Australia. A curious little sedge, *Seleria Neesii* var. *borneensis*, was another important addition to our flora, as its distribution is confined to Ceylon and Borneo. Twining in the grasses close to the stream in damp spots was a pretty *Utricularia* with large

yellow flowers. It was described under the name of *U. involvens*, Ridl.

The ascent to the summit of the mountain is steep in parts but there is a good track through the woods which clothe it to the top. The view from the point is very fine and embraces an extensive tract of country, while on the sea side the Lankawi islands can plainly be seen. The height is estimated at a little over 4000 feet; by my aneroid I calculated it to be a little under, viz., 3495 feet. The southern side is quite precipitous with nearly vertical walls of many hundred feet; at one spot not far from the camp a stream runs over one of these precipices so steep that standing on the edge one cannot see the fall of the stream without bending over. Part of the rocky slopes on this side is coated with turf upon which I was about to step when one of the men restrained me and showed me that at a slight push the whole mass slid off from the smooth rock and went down the side of the precipice. On these rock-slopes grew a pretty *Bau* (*B. elegans*) the only one I have met with which did not grow on limestone rocks, and with it was an *Arundina* with small flowers, not unlike the *Arundina Philippi* of our gardens. The biggest trees on the top were a species of *Pieris*, somewhat resembling an *Arbutus* with long racemes of white bell-shaped flowers. A new species of *Hedychium* (*H. collinum*) with white flowers was obtained, but only beginning to flower. A white-flowered *Canscora* was common near the top. It was quite distinct from the one which grows around the Kwala Lumpur Caves, and is the second species obtained in the peninsula, none being recorded in the Flora of British India.

Orchids are far more numerous here than on Mount Ophir, and in places form an important portion of vegetation. In some spots the ground was so thickly covered by them that one was nearly up to the waist in them and had to cut one's way through the masses of tangled stems. Among the most striking were *Spathoglottis areca*, *Cypripedium barbatum*, *Dendrobium sanguinolentum* and more commonly the pale ochre-colored form *cerinum* *D. Hughii*, with large thin white flowers tinted with violet, and *D. revolutum*. Bulbophyllums were very abundant, among them were *B. longiflorum* with large pink striped flowers with an orange lip, and *B. hispidum* only met with at the very summit,

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with clusters of fairly large deep red hairy flowers with a very putrid odour. Upwards of fifty kinds of Orchids were collected here, of which eight kinds were peculiar to the range. As on Mount Ophir *Dilgynocarpi* were not common and what species did occur seemed to be endemic. Among the most conspicuous Ophir plants absent were *Rhododendron Malayanum* and *R. jasmiflorum*, *Arundina speciosa Dendrobium uniflorum*, *Cladium Main-gagi*, *Lepidosperma Chinense* and *Balanophora*, but this latter being often rather deeply buried in the soil may not be discoverable unless in flower, and may perhaps be found later in the year. On the whole the flora most resembles that of Mount Ophir and is very different from that of the Main Perak hills. The flora of the Lankawi islands which one can see at no great distance from Kedah Peak and where so many remarkable plants have been found by Mr. Curtis is very distinct from that of any part of the peninsula, having in fact a closer relation with that of Tenasserim. I had expected to find on Kedah peak traces of this northern flora, but there was nothing of the kind, the plants are typically Malayan. I remained on the mountain for six days during which the weather was tolerably fine. Rain fell however almost every night. The temperature is fairly cool, the thermometer falling to 70 at sun down. Mosquitoes occur at the camp, which is unusual at this elevation, so those who are troubled by them would do well to take mosquito curtains. The expedition including going from and returning to Penang has, I believe, been done in a day, but it can hardly be worth the labour it entails to make so hurried a visit. The ascent from Yan takes from 3½ to 4 hours, and if wet it will probably take longer as the track becomes very slippery after rain.

## On the Use of the Slow Loris in Malay Medicine.

BY H. N. RIDLEY.

The following instructions for the medical and magic uses of the Loris, were copied some time ago from a manuscript in Malay, and are excellent illustrations of Malay ideas as to medicine. In many respects these receipts recall European medical ideas of some four centuries ago. The notion that one drug will act beneficially in all diseases that flesh is heir to is by no means extinct among the more ignorant classes at the present day, while the use of animals, especially if of strange and uncanny appearance, simply because they were odd looking, was formerly quite common in Europe. Thus the viper, and the scinc (*Mabnia*) were valued highly as late as 1694. (Pomet's Drugs). Still earlier toads, bats and other such animals were used in magic as the Loris is among the Malays and Indians to this day.

The Kongkang, or Slow Loris (*Nycticebus tardigradus*) is common all over the peninsula and also occurs in India. Its strange appearance with its large eyes and ape-like hands, its nocturnal habits and its manner of covering its eyes with its hands, have stamped it in the eyes of all Orientals as an uncanny beast closely associated with demons, which it is supposed to have special facilities for seeing. I have been informed that its tears if applied to the eyes impart such clearness of vision that the person using it is able to see ghosts. The method of obtaining the tears is to take the animal among a herd of cows when it commences to weep, but another plan which indeed sounds more likely to succeed was to wrap the animal's body in a white cloth, and throw pepper in its eyes. The tears are collected on a bit of cotton.

Five varieties of the Loris are recognised by the Malays, viz., the Kongkang ayer, the common grey form, so called

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because it is said it can swim ; Kongkang angin, which is black. This variety is said to have the power of vanishing when a storm arises, if it is merely tied with a string in a house, but if confined in a cage it cannot do. Kongkang api is red with a white mark on its forehead and nose. Kongkang orang is brownish with a red line over its head and down its back. The white variety Kongkang puteh or Kongkang Kayu is very rare and is the most valuable one for magic purposes. It derives its second name from the peculiar property of causing a tree to fall in any desired direction. To effect this it must be either found dead or killed in a special manner known only to an initiated few, its bones are then laid in a row in the direction in which it is desired that the tree shall fall when felled and the tree will fall exactly on the bones.

In cutting up a Kongkang for magical purposes it is necessary that the knife used shall be ornamented with gold. The skull if put in a hole in the ground beneath a house will cause ghosts (hantus) to appear. The fur if burnt and given to a woman to eat will cause her to like her husband however much she may have previously disliked him.

### PASAL PERGUNA'AN KONG KANG.

Ayer mata-nya itu jika di pakai pada badan kita yani di masukkan k-dalam suatu bekas di-pakai sperti azimat, Insha Allah sklian yang minendang kita kaseh sklian-nya.

2. Darah-nya jika di champor dngan dawat di tuliskan azimat Insha Allah mustajab barang perbuat tau-nya, dan jika di champor dngan ayer susu manusia di sapukan pada mulut periok, mlainkan tiada masah nasi itu.

3. Prot-nya itu di jmor kring kring dan apabila kita handak naik rumah orang di asah dngan ayer embon dan jebat di sapukan di dawah lantai-nya nschaya tertidor orang yang di dalam rumah itu dan tiada ktahui kita naik rumah-nya itu, dan jika di sapukan pada binatang yang buas buas, sperti Harimau, Sapi, atau Gajah terplihara deri-pada kjahatan-nya, dan jika orang sakit di asah dngan kulit dedak sdikit di-bri minum nschaya sembah.

4. Prot-nya itu jika di-bri kring kring apabila ada prempuan susu lndak beranak di asah dngan mempedu-nya dan ayer

## USE OF THE SLOW LORIS IN MALAY MEDICINE. 33

mawar di sapukan pada ari ari-nya preinpuan itu uschaya kluar anak-nya itu.

5. Mata-nya yang kanun itu jika di lumatkan di champor dengan susu orang atau susu kambing dan minyak Yatmon di champorkan pada surmoh di-buat chelak uschaya trang mata yang kelam dengan kuasa Tuhan.

6. Mata-nya kiri itu di lumatkan halus halus di champor dengan ayer Mawar, ayer madoo dan kapur barus, di buat chelak mata atau di makan dengan sirih yang bertmu urat uschaya kaseh orang mandang kita, dan jika di bri makan pada binatang yang liar menjadi jinak.

7. Hati-nya itu jika di kringkan baik baik pada panas kindian di lumatkan dan di champor dengan minyak Ziton dan di sapukan pada (Zakar) bawa jinak terlalu lazat, dan jika di tanam pada rumah kita jadi hormat rumah itu.

8. Tulang blakang-nya jika di tanam di bawah pintu rumah kita milainkan tiada boleh puchuri masok.

9. Tulang kaki-nya itu jika di kolom di dalam mulot di bawah berchakap-chakap di hadapan Raja raja lmali lahya berbuat dhalim di atas kita dan jika di masak dengan minyak ular atau harimau atau minyak ziton di sapukan pada kaki orang yang lemah neschaya affiat olehnya.

10. Paruparunya itu jika di tampil pada pintu orang melainkan bercherai berai orang rumah itu.

11. Jantongnya itu di kringkan di ambil satu (kerat) dan di asah dengan (maini) kita di bri makan perumpuan neschaya kaseh dia dengan kita.

### DIRECTIONS FOR THE USE OF THE LORIS.

1. If the tears of this animal be worn on the body, we can place them in a small case and carry as a sacred wand. All persons beholding our countenance shall by God's will bear an affectionate feeling towards us.

2. Its blood may be mixed with ink, and written with as a sacred writing, by the will of God any business will prove successful; and it can be mixed with milk and rubbed on the mouth of a pot, when the rice which is to be cooked will never be done.

### 34 USE OF THE SLOW LORIS IN MALAY MEDICINE.

3. Its gut is to be dried, and when we want to use it, take a piece and rub it on a stone with dew and civet : when rubbed below the floor of a house, the inmates will fall asleep and will not know we are getting in, and if rubbed on wild animals such as tigers, oxen or elephants, the person approaching will be safe from harm, and if ground up with a little bark of Dadup (*Erythrina*) and given to a sick person it will cure him at once.

4. The gut when dried and ground with its gall together with rose water and rubbed on the abdomen of a woman in confinement, will assist to cause delivery.

5. The right eye dried and ground to powder and mixed with human or goat's milk and some sweet oil may be used as an eye ointment which will make dim sight bright by the will of God.

6. The left eye ground fine and mixed with rose water, honey and camphor (*Sumatren*) can be used as an eye ointment or eaten with sirih leaf, the nerves of which meet together causes all who look on us to love us, and if given to a wild beast it will become tame.

7. The heart well dried and ground and mixed with olive oil and rubbed on acts as an aphrodisiac and buried in the front of a house makes it appear respectable.

8. If its backbone is buried beneath the door of the house we can prevent thieves from entering.

9. If the bone of its left leg be kept in the mouth during a conversation with a rajah, it will prevent his doing any acts of tyranny to us, and if we cook it with oil of snake or tiger or olive oil and rub it on the feet of a weak person, it will strengthen him.

10. If its lung is placed beneath the door, the people of the house will be separated.

11. If the liver be dried and a piece taken and rubbed up and given to a woman to eat it will produce in her feelings of love towards us.

A Review of Dr. A. B. Meyer's  
"Negritos."

BY R. N. BLAND.

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A pamphlet with the above title has recently been presented to the Library of the S. B. R. A. S. by the author. It is a translation from the German of two chapters of a larger work, published in 1893, dealing with the Negritos of the Philippines, and is confined to a consideration of the distribution of the Negritos within the Philippines and beyond.

The author, who is the Director of the Royal Zoological, Anthropological and Ethnographical Museum at Dresden, is a scientific traveller of established reputation. He has since 1875 published over 20 volumes on Anthropological and Ethnographical subjects connected with the far eastern Archipelago. The subject is one that possesses a particular interest in this "corner of Asia," as amongst the natives of the Peninsula we have tribes representing the ancient race of Pigmy negroes, small black men with frizzy hair concerning whom science has speculated since the time of Herodotus.

Jakuns, Sakai, Semang, Orang Raiat, Orang Bukit, Orang Panggang, Belenda, Bidnanda are some of the names by which these people are known in different parts of the Peninsula. Possibly the Orang Laut, who to this day inhabit the villages at the mouth of the Rochor River, in the harbour of Singapore, and even the curly-headed "have-a-dive" boys of New Harbour are also related to this ancient people, but this is still an open question.

The author concerns himself only with the distribution of the Negritos in the Far East—that is, where these people are to be met with and where not. In support of his arguments he quotes over 200 different authorities, and more often than not, differs from them.

## 36 A REVIEW OF DR. A. B. MEYER'S NEGRITOS.

The writers that our author quotes most, and differs from most violently, are MM. de Quatrefages and Hamy, both of them anthropologists of renown. To readers of this Journal, the criticisms of the views of M. de Quatrefages will be of interest, as some of these views are set forth in two articles entitled the "Pigmies" published in Nos. 11 and 13 of the Journal, S. B. R. A. S. Let us take some of these references in detail.

P. 23. "The most prolific writer on the Negritos is de Quatrefages, who published a monograph in the year 1872, entitled "Etude sur les Mincopies et la race Negrito en général" . . ;" and then in 1882, together with Hamy, the 'Cranius Ethnica.'

"I will not enter into a detailed discussion of this writer's partially fantastic ideas on the Negrito question. Time will decide whether the views advanced by him with great certainty will hold good, in that traces of the Negritos are found nearly everywhere from India to Japan and New Guinea, and that Negritos and Papuans live together in New Guinea and elsewhere, owned and intermixed, differing from the true Papuans" . . . The same illustrations too are continually reproduced . . . De Quatrefages' literary references are frequently untrustworthy. He is in spite of his shortcomings respected by many writers as a reliable authority, etc., etc."

The "Cranius Ethnica" is a constant stumbling-block and rock of offence to our author. He writes of a certain skull described as coming from Borneo. P. 26. "The mischief caused by this Negrito skull will be carried on in books for some time to come in consequence of this frequent repetition." He is strongly of opinion that the existence of Negritos in Borneo has not yet been proved, and is much annoyed with M. de Quatrefages for assuming the contrary on the evidence of a solitary skull.

Writing of the Moluccas of Lesser Sunda isles, our author disputes an opinion of Prof. Flower regarding the existence of a "small Negroid population" in certain islands. "He is" he says, "surely adopting, absolutely without the test of criticism, 'de Quatrefages' more recent statements (*Les Pygmées*, 1887) which are more or less figments of de Quatrefages' imagination," etc.

Again (with reference to Negritos in Java), "Flower appears here again to follow de Quatrefages (*Pygmées*, 1887)

"blindly, but the statements in question are very much open to controversy." As in the case of Borneo, Mr. Meyer holds that the existence of Negritos in Java has not been proved.

In examining the evidence as to Negritos in Formosa, Herr Meyer again falls foul of "Crania Ethnica" and writes, "For to conclude the occurrence of a race in a country from certain characters in two skulls, when this race has not yet been registered from that country, is in the present embryonic state of craniology, an unwarrantable proceeding, and the two French writers will certainly find no follower in this respect, except such as simply copy their assertions."

Here Meyer disputes the existence of Negritos in Japan, on the evidence of certain skulls described by Hamy. He writes: "In consequence, this Negritos Japanese skull found its way into the 'Crania Ethnica' and was duly recorded in all the writings of de Quatrefages and in many others."

As regards China, Herr Meyer equally questions the evidence as to Negritos. "De Quatrefages and de Lacouperie looked upon each other as authorities, the assumption of the one standing for truth to the other, and *vice versa*; in consequence they tried to support each other, but it is more than questionable whether others will have the same belief in the categorical statements of these two writers."

In short, as regards the Dutch possessions, China and Japan, Herr Meyer finds that all accounts of Negritos outside the Philippines are traced on very poor evidence, or properly speaking on none at all. He reminds one of the famous chapter in the "Natural History of Iceland" headed "Snakes—There are none." Professor Meyer goes on to discuss the Negritos question as it concerns the Malay Peninsula, the Andamans, the Mergui and Nicobar Islands, Anam, Cochinchina, Cambodia, India, Australia, and New Guinea. He glances (p. 72) at the question as to whether we are to regard the Negrito people as the little modified descendants of an extremely ancient race, ("gens prisca mortalium") the ancestors of all the Negro tribes, or whether they may be regarded as a type of comparatively recent growth, retrograded to their present condition after centuries of isolation and confinement to a limited space. "For at the present time our knowledge of the mutability and amount of

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"variation in organic form and their result is still so inadequate,  
"that it is extremely rash to speculate in this general manner on  
"the genetic connection of races, and doubtless easier to set up  
"a clever hypothesis than to prove its full legitimacy, let alone  
"necessity."

In his conclusion he deplores the practice of describing skulls in detail "which will never lead to profitable results." He thus takes a final shot at the "*Crania Ethnica*." "Whoever wishes to obtain an idea of the chaos which reigns here let him read the '*Crania Ethnica*' of de Quatrefages and Hamy: he would need Ariadne's clue to find his way in this labyrinth of skull descriptions."

He appeals to "some able investigator" to dedicate his powers to the Negritos of the Philippines (as the Saranies have done for the Weddas), and hopes that later generations will attain to the "heights of knowledge" and be able to look back to the present time with its gropings in the dark, its daring hypotheses, its paucity of facts, as the childhood of Anthropology.

## A List of Brunie-Malay Words.

COLLECTED BY H. S. HAYNES.

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NOTE. In Brunie-Malay the final *k* sounds *strong*.

There are a number of obsolete Malay words in common use here—such as *tapih*, a short sarong, but as they are to be found in the dictionary of L'Abbé Favre I have not put them in this list. Here many Malay words are altered slightly, as for instance *lari* for *layer*, a sail (*lari berlari*, to sail.)

GAYA, 27th May, 1900.

Achang	.	.	The tame pigeon.
Ajie	.	.	The chin.
Alak Alak	.	.	The uvula.
Ali Ali	.	.	Separate.
Alun Alun	.	.	A road.
Ambok	.	.	A monkey.
Ambulong	.	.	Raw sago.
Ambuyet	.	.	Cooked sago.
Ampas	.	.	Accent.
Ampol	.	.	Light (not heavy).
Ampuan	.	.	A title of rank.
Ampus	.	.	Asthma.
Anchow	.	.	A fine net for catching Bubuk, made of Sadok.
Andang Andang	.	.	From the beginning.
Andiang	.	.	The frond of the Cocoanut palm.
Ang-up	.	.	To stutter.
Anus	.	.	The cuttle fish.
Arang Atasan	.	.	Soot.

Arap Arap	.	To cut up small.
Arik	.	To call.
Arok, Mengarok	.	To thrust a spear up through the floor of a house.
Aukup, Snapang	.	A breech-loader.
Aumpok	.	A box made of Selad leaves.
Auras	.	Rubbish.
Aurok	.	To open.
Ausai	.	To settle. To arrange matters.
Ausus	.	A bradawl.
Autik	.	Cataract of the eye.
Babat	.	To tie.
Babau	.	Dumb.
Badong	.	An eel.
Baguring	.	To roll.
Bakat	.	A scar.
Bakut, Membakut	.	To heap up.
Balan	.	Steel.
Balong	.	Jelly-fish.
Balot	.	Béche-de-Mer.
Bangas	.	Sour, Stale.
Bangkawat	.	The rainbow.
Bangking	.	A bug.
Bamun	.	A herd of cattle.
Bari	.	Steel.
Basak	.	A fisherman's basket
Basing	.	A squirrel.
Baston	.	A walking-stick.
Batah	.	A long time.
Batak	.	To rob. Cattle-lifting.
Baul	.	Brackish (of water.)
Bawet	.	Cycas revoluta.
Bayung	.	A bag made of rushes.
Beabas	.	Guava (fruit.)
Beading	.	Shark's fins and tails.
Beli	.	A stick of tobacco.
Beluri	.	To get, to catch, to obtain.

Bengkatang	.	.	The Proboscis Monkey.
Benukal	.	.	An earthenware jar.
Berbakut	.	.	To box. To fight.
Berkami	.	.	To make water.
Barega	.	.	To proclaim.
Berling Katak	.	.	A frog.
Berling Karong	.	.	A grass lizard.
Bergalop	.	.	To play. To act the fool.
Berinyut	.	.	Slowly, by degrees.
Berkrapak	.	.	To speak.
Berleon	.	.	To go round.
Bélusier	.	.	To run.
Bertanggar	.	.	To pole a boat up stream.
Bertapak	.	.	To hide.
Betian	.	.	Pregnant.
Blani	.	.	An earthenware jar.
Blatak	.	.	A basket.
Brian	.	.	Money, or goods paid for a wife.
Bubuk	.	.	The small shrimp.
Bubut	.	.	To follow, to chase, to pursue.
Bubus	.	.	Worn in holes at the bottom.
Bujak	.	.	A spear.
Buli Buli	.	.	Sand fly.
Bunga Lapang	.	.	The white crest on the waves, (breakers.)
Bunga Takat	.	.	Sponge.
Bungkutut	.	.	The fresh water shrimp.
Bungal	.	.	Deaf.
Bungal	.	.	The sea turtle.
Bruet Ruet	.	.	Barbed as a fish spear.
Buyuk	.	.	To cheat.
Chabok	.	.	A bathing bucket.
Chaka	.	.	Industrious.
Chakal	.	.	To wrestle.
Chandas	.	.	Chinese chop sticks.
Charok	.	.	The bow of a boat, or ship.
Chuet	.	.	A plate.

Damal	.	.	Damp.
Damit	.	.	Small.
Dapong	.	.	A boat with outriggers.
Dudus	.	.	Mutilated.
Dugal	.	.	Spleen. Nausea.
Eno	.	.	Phosphorescence of the sea.
Epong	.	.	An earthenware jar.
Gabus	.	.	Proud.
Gadong	.	.	Green.
Gagar	.	.	To shake.
Gagas	.	.	In haste.
Gaggo	.	.	To be busy.
Gaggut, Bergaggut	.	.	To make a disturbance.
Garit	.	.	A scratch.
Gauk	.	.	Wicked. Naughty.
Geok	.	.	A worm.
Gaul Bergaul	.	.	To sound a gong.
Gubong	.	.	A dug-out canoe.
Gucho	.	.	An instrument for pounding betel nut.
Gulian	.	.	Vegetables.
Guling Tangan	.	.	7 or 8 graduated gongs.
Guntian	.	.	Thread for sewing.
Gureding	.	.	A Jew's harp.
Gusey	.	.	A sacred jar.
Hias	.	.	To make haste, to spurt, to finish.
Inda Inda	.	.	Different kinds of things.
Indek	.	.	To kick.
Indong	.	.	Mother, of animals.
Ingut	.	.	To shake in a pile.
Jagau	.	.	Tall

Jahat Nawa	.	.	Sick, unwell.
Jelamah	.	.	A human being.
Jenguni	.	.	The Nicobar pigeon.
Jurong	.	.	Oval.
Kaban	.	.	A box.
Kalabutan	.	.	The cuttle fish.
Kalakati	.	.	Betel nut scissors.
Kalas	.	.	Light red colour.
Kalat	.	.	Rope.
Kalindo	.	.	A jungle spirit.
Kamah	.	.	Dirty.
Kanowi	.	.	The white paddy bird.
Kapiman	.	.	Misfortune.
Karo	.	.	Stiff.
Katawi	.	.	A place for paddy.
Katrahan	.	.	A place for fowls to lay and sit.
Keap	.	.	A fan.
Kelala	.	.	To recognize.
Keri	.	.	The eye brows.
Keri	.	.	Nepa leaves used to make cigarettes.
Kubot	.	.	An earthenware jar.
Klakar	.	.	To speak falsely.
Kudut	.	.	A plate.
Kuling Bambong	.	.	A butterfly.
Kuling Papat	.	.	A firefly.
Kuratu	.	.	In times long ago.
Kuroh	.	.	To snore.
Lago	*	.	To call.
Lakat	*	.	To remain, to stay in a place.
Lalam	*	.	Rain when the sun shines.
Lalap	*	.	Meat dried in the sun.
Lambu	*	.	The Illanun boat.
Lampo	*	.	Stout, fat.
Lamunta	*	.	Raw sago.
Langis	*	.	Clean.

Langong	.	A cooking pot.
Lanto	.	A bad smell.
Lasak	.	Bald headed.
Lasuk	.	A basket.
Laungan	.	A curtain.
Lauk	.	Live or fresh fish.
Lechak	.	Soft.
Lekup	.	The small hornbill.
Limpaku	.	A passage between the coral reefs.
Limpong, Malimpong	.	To lie down.
Lulan	.	A seam, a hem.
Lulup	.	A woolly kind of stuff obtained from the Bengkola Palm, used to caulk boats.
Lundong	.	Lazy.
Malagas	.	Bald, leafless.
Malangup	.	To open wide the mouth.
Mandu	.	10 Gantang measure.
Mata-Mata-i	.	To mend a net.
Mauk	.	To vomit.
Menggagap	.	To feel about in the dark.
Meris	.	Leaky, not water-tight.
Maritam	.	Pulason fruit.
Mais	.	Orang utan.
Moah	.	The face.
Mungalimut	.	To slander.
Muli	.	To return, to go home.
Nandong	.	The dragon fly.
Napu	.	Sago flour.
Nyanat	.	To repeatedly commit the same offence.
Pajah	.	To put out a light.
Pajal	.	To force.
Pakaram	.	To fish.
Pakarangan	.	A fishing boat.

Pakul	.	.	A saddle.
Palowi	.	.	A fool.
Pampangan	.	.	Stocks, place of punishment.
Pandiang	.	.	A prostitute.
Pandidip	.	.	Matches.
Panggal	.	.	To cut in two.
Panguling	.	.	A midwife.
Panyangat	.	.	A wasp.
Papak	.	.	To chew.
Pantaran	.	.	Verandah.
Paropok	.	.	Bamboo grass.
Patungut	.	.	A fire stick.
Peasow	.	.	The cocoanut palm.
Pengaluru	.	.	To mock.
Pengambat	.	.	A travelling trader.
Peratasan	.	.	The watershed.
Petang	.	.	Dark. Darkness.
Piho	.	.	Deer ( <i>Cervus.</i> )
Piok	.	.	To handcuff.
Porok	.	.	Earth eaten by the natives.
Puchok Rabong	.	.	The gums.
Pundok Pundok	.	.	To sit idle.
Pungarusan	.	.	A charm attached to a fishing net.
Pungaut	.	.	A rice spoon.
Pungar	.	.	A dead tree.
Puputan	.	.	Bellows.
Rahsp	.	.	A shroud.
Radu	.	.	A plough.
Rambat	.	.	A casting net.
Ranik	.	.	Small, as leaves.
Rangit	.	.	Mosquito.
Ranggas	.	.	Leafless.
Repow	.	.	The refuse of sago.
Rampok	.	.	To shake out.
Rogat	.	.	Torn ears.
Rumbia	.	.	The sago palm.

Runding	.	.	To make up an account.
Sabang	.	.	A pass between the reefs or sand banks.
Sabal	.	.	Blunt.
Sabat	.	.	A knapsack.
Sadok	.	.	A kind of coarse canvas.
Sadi	.	.	To dry a boat.
Sadian	.	.	A boat shed.
Salajur	.	.	At once.
Salambo	.	.	A fishing net.
Saling Kawang	.	.	Bracken fern.
Samandak	.	.	A heifer.
Sumba Sumba	.	.	Mantis (Praying Insect).
Sambat Sambat	.	.	Early in the morning.
Sampar	.	.	An evil spirit.
Sangup	.	.	A fish spear.
Sapar Sapar	.	.	Divided.
Sarah	.	.	A box.
Sarang Sarang	.	.	A dish cover.
Saroung	.	.	A conical hat.
Sarudong	.	.	A hut built on the floor of an unfinished house.
Sawang	.	.	A hole.
Sear	.	.	A shrimp.
Sebur	.	.	Raised divisions in the paddy fields.
Segi	.	.	Cowry-shell.
Segup	.	.	Tobacco.
Selering	.	.	A fishing net.
Sepok	.	.	Having an extra finger or toe.
Sekup Keri	.	.	Left-handed.
Sekut	.	.	To carry on the back.
Selankier	.	.	The starling.
Serah	.	.	Salt.
Sering	.	.	The edge. Sea shore.
Serong	.	.	The spaces between the posts of a house.
Seut	.	.	A landing net.

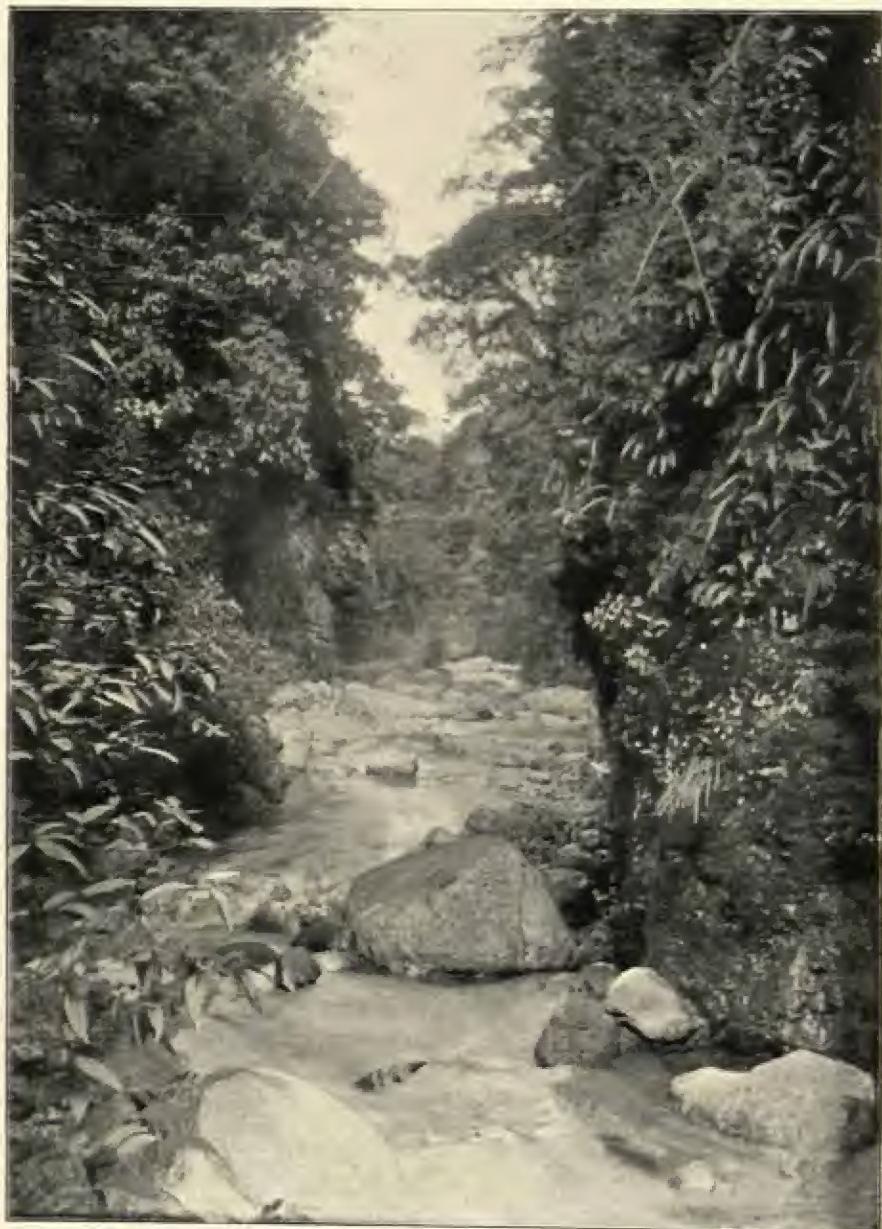
Spurdian	.	.	Of one family.
Stagal	.	.	A little time.
Stampik	.	.	One side.
Sulup	.	.	A hut, a shelter.
Sumbrana	.	.	Careless.
Suri Pimping	.	.	A kind of bamboo grass.
Suroh	.	.	A cricket.
Tabok	.	.	A window.
Tabak	.	.	To stab.
Tagar	.	.	Rust.
Tajow	.	.	A jar.
Takat	.	.	A coral reef.
Tambok	.	.	A cooking place.
Tambing	.	.	The river bank.
Tambuku Bamban	.	.	Buttons.
Taming	.	.	A shield.
Tampeling	.	.	A slap in the face.
Tampik	.	.	To split wood, etc.
Tangan Tangan	.	.	The castor oil plant.
Tunghil	.	.	The Cicada.
Tapuk	.	.	To hide.
Tara Tara	.	.	A sea gull.
Tarok	.	.	The colour magenta.
Tébaro	.	.	Bamboo grass.
Tekuyong	.	.	A shell.
Tepi	.	.	Pearl shell.
Teranang	.	.	A water bottle.
Timbaran	.	.	A tree of the bread-fruit kind, the bark of which is used to make rope called Pelian.
Tislear	.	.	To make the mouth water.
Tengkalak	.	.	The block fixed on the top of the tripod bamboo mast of a boat.
Trepas	.	.	The small green love bird.
Tumpong	.	.	A bamboo used for carrying water.

Tumpuk	.	.	Heaps, groups, tufts.
Tanduk	.	.	The scalp lock.
Tundun	.	.	The back of the neck.
Tunkus	.	.	Grave-clothes.
Turuk Turuk	.	.	A silver heart-shaped ornament for a little girl.
Yubengkong.	.	.	The hammer-headed shark.



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R. Hanitsch Phot.

Kadamaian River, Kina Balu, British North Borneo, 2000'

(LOOKING DOWN).

## An Expedition to Mount Kina Balu, British North Borneo.

BY R. HANITSCH, PH.D.

(*With four plates.*)

*Introductory remarks:* The first part of this paper, containing the narrative of the expedition to Kina Balu, is based upon diary notes written during the journey and is practically the report which I sent in to the Committee of the Raffles Museum on April 27th of last year. The second part, containing the scientific results, could only be compiled after considerable delay: most of the zoological specimens obtained during the expedition had to be sent for identification to specialists at home and elsewhere, viz., Messrs. G. A. Boulenger, Edgar Smith, L. de Nicéville, R. Shelford, D. Sharp and L. A. Borradaile, and I take this opportunity of thanking them for their assistance. Two papers by Mr. Boulenger, the one containing the description of a new Freshwater Fish (A. M. N. H., Ser. 7, Vol. IV., pp. 228-229) and the other that of three new Reptiles and a new Batrachian (*ibid.* pp. 451-454), and a paper by Mr. Borradaile on Freshwater Crustacea, one of which is new (*P. Z. S.*, 1900, part I, 2 pp.) are reprinted.

The Government of this Colony had kindly furnished me with credentials to the British North Borneo Government, and my thanks are due to the officials there, chiefly Mr. R. M. Little, Resident of Labuan, and Mr. H. S. Haynes, Magistrate, Province Keppel, who made all arrangements for carriers and who otherwise assisted me in every possible way.

### Narrative.

The Mount of Kina Balu, British North Borneo, was first ascended in the year 1851 by Hugh Low (6), and since then by Spenser St. John (8) in 1858, F. W. Burbidge (4) in 1877, R. M. Little (5) in 1887, John Whitehead (10) in 1887 and 1888, and

G. D. Haviland (9) in 1892. The idea of attempting the ascent myself occurred to me in January last (*i. e.* 1899) when I made the acquaintance of Mr. H. T. Burls, M. I. M. E., F. G. S., who was passing through Singapore on his way to North Borneo in order to prospect there for oil, and who wished to ascend Kina Balu apart from his primary business object. After some discussion on the subject in Singapore, we settled the preliminary arrangements for a joint expedition by correspondence after Mr. Burls had arrived in Labuan. H. E. Governor Beaufort, British North Borneo, expressed his willingness to join the expedition.

I left Singapore by the S. S. 'Ranee' on *Saturday, March 4th 1899* accompanied by my assistant P. M. de Fontaine and two native servants, a Chinese cook and a Malay, and reached Labuan, after an unfavourable passage, on *Thursday, March 9th*. Mr. R. M. Little kindly met me on landing and explained to me the various preparations for transport and carriers which were being made by Mr. Haynes at Gaya. Unfortunately I heard at the same time that Mr. Burls and H. E. Governor Beaufort were prevented from joining the expedition, the former through an accident to his knee, the latter in consequence of his accelerated departure for Europe. However, Mr. Burls kindly offered to take me on a short trip to Brunei the next day, and we slept the night on board his steam launch "Marudu" in order to make an early start for Brunei.

*Friday, March 10th.* We left about 8.30, a.m. for Brunei, arriving there at 9. a.m., explored the neighbourhood a little, visited a pawnshop where I bought a number of parangs and krisses for the Raffles Museum, and left again in the afternoon. We arrived in Labuan at 8 p.m. and slept on board the 'Marudu.'

*Saturday, March 11th.* Mr. Burls being unable to accompany me, I chartered the steam-launch 'Enterprise,' started from Labuan at 8.45 a.m., and had a pleasant run to Gaya, where I arrived at 7 p.m. We landed at the pier which is in process of being broken up. Since Mat Salleh destroyed the greater part of this village, including the Government offices, in 1897, the latter have been shifted to Gantian, on the mainland of Borneo, and the woodwork of this pier is now required for Gantian. In the darkness we climbed along the remains of the pier (at least  $\frac{1}{4}$  mile long), and, when near the other end, were rescued by a

native boat. Soon after, we met Mr. Haynes. As Mr. Little in his letter of instructions to Mr. Haynes had recommended that we should take the Tuaran route to Kina Balu, he very kindly promised to accompany me the next day as far as Panjut, a village on the mainland where our luggage carriers were awaiting us. I slept on board the 'Enterprise.'

*Sunday, March 12th.* We left the 'Enterprise' at sunrise and noticed crowds of the long-spined Sea-Urchin *Diaedema setosum* in the shallow water below the pier, mostly sticking on to pieces of rotten timber lying at the bottom. From a fisherman we obtained a large number of the huge worm *Sipunculus robustus* which he was digging from the sandy shore for bait. At 8.30 a.m. we left Gaya in two rowing boats manned by Bajous, and had a most pleasant journey. When nearing Gantian, we passed through shallow water with beautiful corals and numbers of the striking red and black starfish, *Oreaster nodosus*. At Gantian, usually known as Kubaggan by the natives, we met Mr. C. H. Keasberry, Sub-Treasurer and Postmaster. Then proceeding, we entered the Menkabong river at 1 p.m., passed the village of Mumpelum at 2 p.m., and soon after reached Berunggis where we landed. Here, without waiting for the second boat in De Fontaine's charge, which had dropped somewhat behind, Mr. Haynes and myself, with a few of the men, walked on to Panjut, about  $2\frac{1}{2}$  miles distant, passing through swampy fields with exceedingly poor padi—I hear by the way that this year's padi crop has been a failure throughout North Borneo—and reached Panjut at 3.15 p.m. We settled down in a spacious Dusun house, with a splendid verandah, ornamented with about twenty head-trophies, and caused the drums to be beaten, which signal was to call the men to fetch our luggage from Berunggis. After about  $1\frac{1}{2}$  hours' waiting, six Dusuns appeared with sledges drawn by water-buffaloes and started off towards our boats. At 6 p. m., as there were no signs of the luggage, I went back to Berunggis to hurry the men on and found that the second and larger boat had been obliged to stop lower down the river, as the tide had gone out, and that only a part of the luggage could be removed that evening. We returned towards Panjut, and feeling somewhat fatigued I mounted a water-buffalo, but as it floundered into a hole, I was promptly thrown off.

The harness was broken and the luggage upset, but otherwise no harm was done, and I mounted another buffalo, this time behind a Dusun driver; our progress was now safe, but the odour arising from my driver necessitated my holding my nose at a laterally elevated angle of 45°.

*Monday, March 13th.* We signalled for more men to fetch the rest of our luggage, but, after long waiting, only two men appeared. We followed them towards Berunggis and found a large fair in progress where the Dusuns from the interior were selling and exchanging their jungle produce with the Bajous, from the coast, for fish, etc. Here Mr. Haynes introduced me to Malagup, a Dusun chief, who was to accompany me to Kina Balu, in charge of the coolies. Not catching the man's name I asked him directly for it, but was told by Mr. Haynes that the natives, and especially the chiefs, feel offended at being asked for their names directly; one is supposed to know them and in any case must find them out from a third person. Most of the Dusuns had come to the fair on their buffaloes, so that we now found no difficulty in getting sufficient conveyances for our luggage. Mr. Haynes here left me to return to Gantian, and I went back to Panjut, arriving there about 11 a.m. The coolies in the meantime had begun to gather, but appeared most indolent; they tried package after package, but finding them all too heavy, dropped them again in disgust. The situation seemed hopeless; even Malagup had vanished, and in the burning mid-day sun I had to go to his house, two or three miles distant, to look for him. I rode back on a buffalo to Panjut, but now our patience with the carriers was exhausted. The men had apparently only been awaiting for some forcible language, and at last took up the luggage. We made a start at 2.30 p.m., and after about 10 minutes' walk from Panjut we reached the broad and rapid Tuaran river. Only a single small boat, a dug-out, was available, and it took more than an hour to ferry us all across. Here we met a jovial old Chinaman who invited us to spend the first night in his house, in the village of Bandeian, not quite 2 miles higher up on the right bank of the Tuaran. This we accepted. The first day's march was thus only short, but I was glad to have made a start, and to have got the coolies away from their homes. They camped on a nice grassy ground be-

tween the house and the river, whilst I, with my men from Singapore, slept inside.

*Tuesday, March 14th.* We left the Chinaman's house at about 7 a.m., walking through an open cultivated plain, passing many buffaloes grazing there who were apparently on the best of terms with flocks of snow-white herons who stalked about between them, or stood on their broad backs. We reached Menkaladai at 8 a.m., and soon after arrived at the foot of a long chain of hills. The ascent was steep and slippery, sometimes passing through old jungle, more often through high bamboo, lalang and fern. We rested on the top of the hill, and refreshed ourselves with delicious water from the branches of a creeper, called Pokok Gimatal by the natives, which the men cut off with their parangs, for every man was thus armed, some also carrying spears in addition. We marched on, and reached Kappa at 1.30 p.m. This is a miserable village of four or five houses in the midst of the jungle, with no attempt at a clearing, but plenty of filth and pigs about. We settled down in a house adorned with ancient skulls of deer and wild boar.

*Wednesday, March 15th.* We left Kappa at 8 a.m., and walked along mountain ridges through bamboo, fern, and deep grass, or occasional forest. Drizzling rain set in soon and lasted for some hours. In the afternoon we passed through several clearings indicating the vicinity of a village, and reached Kalawat at 4 p.m., though some of the men only turned up at 6 p.m. This was a small but picturesque village, looking like an oasis in the wilderness around : an open grassy space with granite boulders lying about, and clumps of coco-nut palms shading the houses. The houses, however, were few, about five, and small, and their unpromising interiors together with the fineness of the night induced us to pitch our tent and camp outside. Many of the men did likewise. Malagup showed himself useful by buying for us a fowl and a joint of bamboo full of honey for seven cents.

*Thursday, March 16th.* About 2 a.m. I was awakened by a heavy thunderstorm. I felt safe and comfortable in my tent (tent by the P. W. D., Singapore), till suddenly a little rain came trickling through my blanket, and I roused myself to find that it was pouring into the tent which was supposed to be waterproof.

To leave the tent and take refuge in the houses seemed impossible ; it was pitch dark and the weather outside too awful. So I remained soaking till 6 a.m. when I fled to the next house. This experience cost us dear, since many of our things got wet through and remained so for several days. We left Kalawat in disgust at 9.50 a.m., fine rain falling at the time, but fortunately the sun came out soon after. Our path now descended, and we had an easy march to the Inuman River, arriving there about noon. This is a splendid river, rushing along over boulders and shaded by mighty trees. Here we bathed and the men caught me some remarkable tadpoles with huge suckers (*Rana carlymponum*). They always found these tadpoles attached to the boulders in the most foaming parts of the river. We crossed by a ford to the left bank, and then over a low watershed and reached the Menteran River. This river we had to ford three times in close succession : the natives apparently making a specialty of short cuts : in this case it seemed to me it would have been much easier to ford the river once and then proceed along the bank, but my guides had different ideas. At 2.45 p.m. we reached Bungol, a large village on the left bank of the Menteran. Here the men begged me for a treat to buy them a bullock. As this somewhat startling proposal only involved an expenditure of \$3, and it was a splendid young beast, I agreed, and much admired the speed with which the animal was despatched and disappeared in the various cooking pots. I myself had an excellent steak before me about an hour after the bargain had been concluded. Heavy rain fell during the late evening.

*Friday, March 17th.* The day opened somewhat foggy, but fine, and we started at 7.45 a.m., fording the Menteran three times, and ascending Gunong Kampil by a slow incline. Then followed a tremendously steep descent, about 2000' down a grass-covered slope, to the Kadamaian river, which is the local name for the upper course of the Tampassuk. The river here is already deep and difficult to ford on account of its strong current. The men were up to their necks in water, and had to carry the luggage on their heads. Fortunately everything remained dry, with the exception of my camera. We rested on the right bank of the river, and reached Koung at 2.15 p.m., having had fine weather during the march, though rain set in

soon after. I heard that the rice coolies were awaiting us in this village. They had left Panjut on March 5th with instructions to proceed to Kiou, but, being afraid of the people of Kiou, they had stopped here.

*Saturday, March 18th.* We left Koung at 7.40 a.m. and proceeded along the right bank of the Tampassuk, climbing over many cliffs and boulders along the edge of the river. Then we forded the deep and rapid river Lobang near its junetion with the Tampassuk, passed through some swampy undulating ground covered with grass, fern and bushwood, forded the small and winding Kiulan river several times, ascended a high and steep hill, and reached Kiou at 12.30 p.m. Kiou is a village of considerable size, the largest we had met so far during our march, scattered over an extensive grassy clearing on an enormous slope, with many clusters of coco-nut palms in the vicinity of the houses. I heard that I was the first European who had visited Kiou for four or five years, but it is apparently more than that, as two men showed me certificates from Dr. G. D. Haviland, dated April 24th, 1892, which stated that the bearers had acted as his guides during his ascent of Kina Balu in March 1892. Dr. Haviland, called 'Tuan Bunga' by the natives, seems to have been the last European here, and before him Mr. John Whitehead in 1887, who is remembered as 'Tuan Burong.' Malagup, the Dusun Chief, here came to me soon after our arrival, saying:

*M.* 'Tabek, Tuan, itu orang coolie mau satu ayam.'

*R. H.* "Apa? Itu orang coolie samoat samoat mau satu ayam?"

*M.* 'Tabek, Tuan, satu ayam besar.'

*R. H.* "Satu ayam besar? Apa macham ayam besar?"

*M.* 'Tabek, Tuan, satu kerhan.'

The men had apparently enjoyed the bullock I had given them two days before, but I am afraid my answer to Malagup did not encourage similar requests. Still the men seemed to be bent on pleasure, for they asked me for a holiday the next day, which happened to be a Sunday. To this I agreed. In the morning the weather had been dry, except for a few minutes of drizzling rain. But we had rain all afternoon till late into the night. Aneroid at 3.45 p.m. 2400'; thermometer 76° F.

*Sunday, March 19th.* I ascended with De Fontaine to the top of Kiou hill which is covered with deep jungle and is about 1000' above the village. From a clearing we had a wonderful view of Kina Balu; nothing intervened between here and the foot of the mountain which seemed scarcely more than three miles off, and the top of the mountain, bare and rocky, stood out chiselled clear and sharp against the sky. Our success in collecting was small, but the men brought in a good deal, especially stag-horn beetles and several species of coconut beetles. *Megalophrys mantsa*, the strange frog with the large projecting triangular eye-lids and triangular flap to its nose, seemed to be common here, as we found it the day before in Koung. I interviewed the guides: the one informed me he could only start with us in two days, as he had to get a fowl and seven eggs for sacrifice to the spirits of the mountain. Arguing with him led to no results. The other guide, however, declared that he would be ready on the next morning.

*Monday, March 20th.* We rose early to make a start for Kina Balu, but the coolies, who had scattered over the whole village, were slow in assembling. I interviewed Malagup at 8 a.m. and tried to expedite matters, but at 10 a.m., as sufficient men had not appeared, I decided to leave some of my luggage behind and start. But we had still to wait for the guide who finally turned up after urgent messages. He now refused to go without his colleague, the fowl and the seven eggs. So at 10.45 a.m., with blessings on the guides, the fowl and the seven eggs, I decided to abandon the start. Things seemed utterly hopeless.—Morning sunny, afternoon dreadfully rainy and dreary.

*Tuesday, March 21st.* Dull morning, rain until daybreak. The men really turned up soon after 6.30 a.m., but a start was not made until 7.30 a.m. After a steep descent we reached an isolated group of houses, which the natives still called Kiou, at 8 a.m., aneroid 1800', then continued the descent to the Kadamaim River which we reached at 8.25 a.m., aneroid 1500', crossed twice by bamboo bridges and twice by fords, passed a little village in the midst of an extensive plantation of Keladi and a little maize, had to cross by a formidable ford just below the place where the river forms a small island, and from there

our way lay almost exclusively inside the bed of the river which consisted of a never-ending series of foaming cataracts rushing over boulders of granite, and we had to force our way through the one and climb over the other. The men seemed disheartened, and the guides recommended waiting a day for the water to go down. This seemed an empty excuse at the time, but a little experience showed us later on how very variable the height of the water is in these mountainous regions. We still plodded on, and after many difficulties and some mishaps—one of which was the breaking of the ground glass of my camera—we reached at 1 p.m., a spot on the bank of the river sheltered by a huge slanting rock. Here we camped. Aneroid 2150'.

*Wednesday, March 22nd.* I slept little during the night, being kept awake by the comparative cold (about 65° F.) and the roaring of the river. Aneroid, 6.30 a.m.: 2050'. We started at 8.25 a.m., proceeding again chiefly in the bed of the Kadamaian. The cataracts and boulders were, if anything, worse than the day before. My sturdy Chinese cookie got washed away by the torrent, but was rescued by the men. After some hours we finally left the river, and began a steep ascent, first along a little brook which came dancing down over precipices, then along an ordinary steep jungle path. Mosquitoes, which during the whole journey, even in the native houses, had been scarcely noticeable, began, from about 3500', to be very troublesome whenever one was still. At 2.45 p.m., we reached a huge ledge of rock similar to the one under which we had camped the previous day. Here we stopped. When changing, as I always did on reaching camp, I found a leach on my leg, the only one during the whole expedition, although I took no special precautions against them. Aneroid 4140'. Sunny morning, foggy late in the afternoon, and a little rain.

*Thursday, March 23rd.* Another cold night, during which, as in fact during the whole expedition, I enjoyed little sleep, feeling the cold chiefly in my joints, notwithstanding plenty of warm clothing and blankets. The morning opened dismal, with drizzling rain. The guides informed me that it would now take two more days to reach the cave (about 9500'), and as at that rate probably two additional days would be required to reach the summit (13,698'), and probably as much time again to descend

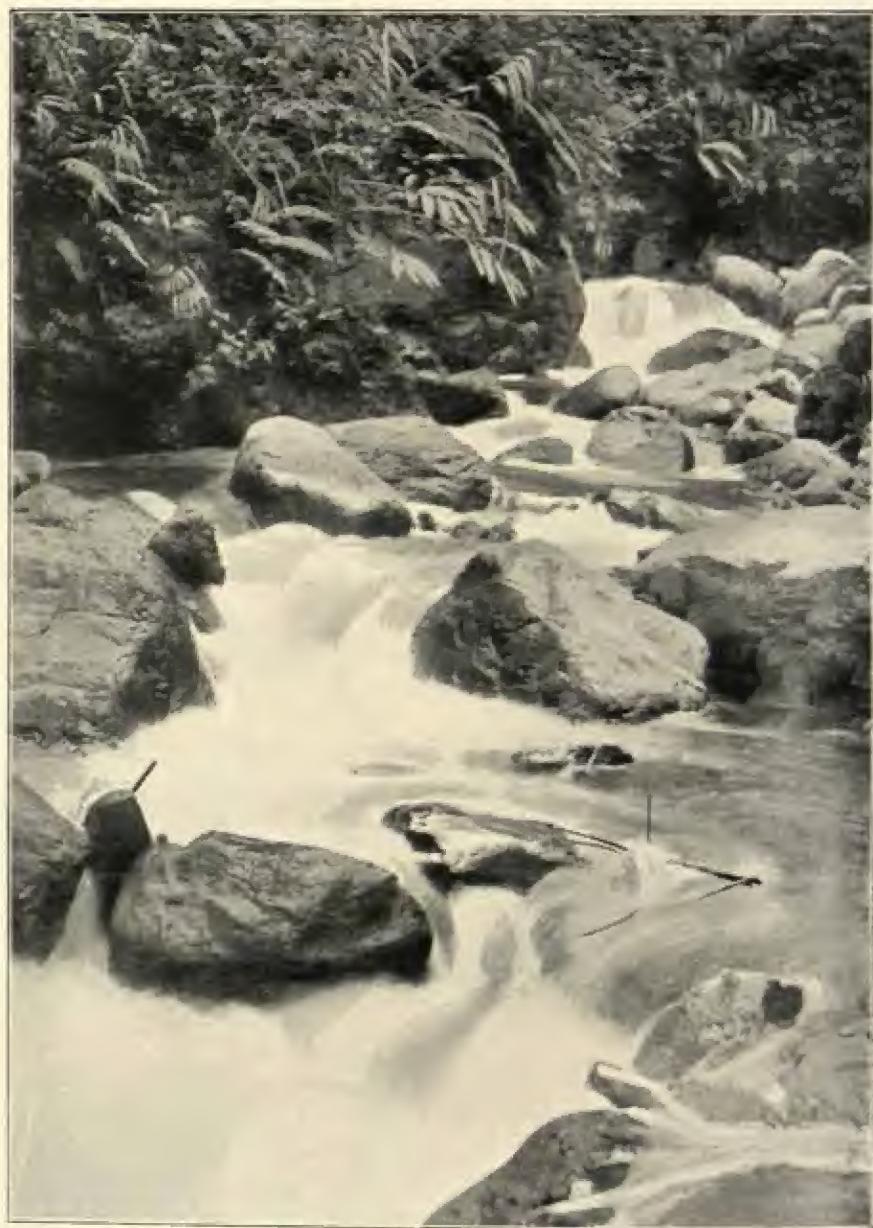
to where we were, say eight days in all, without any time for collecting, and as of the first half of the time allowed for the expedition only two days were left, I decided to proceed no further, but to begin to collect on the spot. I was also influenced by the guides' statement that the next climb would be stiffer than before and would have to be done without shoes, and that most of the men and the bulk of the luggage would have to be left behind. That these statements were no exaggerations, I knew from the accounts of former travellers. It was a severe disappointment to give up the idea of reaching the top, but I saw that a hurried climb with all sorts of discomfort would bring little practical result, and that the aim of the expedition would be served better by collecting now on the lower ranges of the mountain. I therefore made the men go out collecting, and as I promised them little rewards, I was kept busy all morning receiving and bottling specimens. Dismal rainy afternoon, during which I amused myself (and still more the natives) by compiling a little Dusun vocabulary, chiefly with Malagup's help. Temperature at 5 p.m. 66°. Glorious sunset. Fine moon during the night which, however, did not favour sleep, and though the slanting rock protected us against rain, it was of no use against the moonlight.

*Friday, March 24th.* The temperature between 5 p.m. on the previous evening and 7 a.m. varied between 60° and 64° F. Aneroid 4210'. I went out collecting with my men in the vicinity of the camp. The ground was exceedingly steep, and there was a great deal of loose rock about; I had constantly to warn the men to collect at the same level, not below and above each other; the rocks were continually crashing down into the valley like miniature avalanches. Mosquitoes were again very troublesome in parts of this jungle. The men brought in small Mammals (shrews, squirrels, rats), trapped during the night, and also a good many Reptiles, Amphibians and Insects. A welcome surprise: the guides, who were now convinced that I should not attempt to ascend to the summit, presented me with the fowl which had been intended for the spirits of the mountain. Apparently we did not require any spiritual protection in these lower ranges. The natives evidently did not mean to swindle the gods, as the fowl was most excellent and tender. Maximum



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R. Hanitsch, Phot.

Kadamaian River, Kina Balu, British North Borneo, 2000'

(LOOKING UP.)

temperature during the day : 67°, down to 65° at 5.45 p.m.; fine, but foggy, in the morning; the usual rain in the afternoon.

*Saturday, March 25th.* Temperature during the night 60°-5°-63°. Nice clear morning. Many frogs were brought in by the natives. We packed, and began our descent and our way home at 9.45 a.m., as now the first half of my leave had expired (*i. e.* three of the six weeks.) We reached the Kadamaian at 11.45 a.m., and our old camp, under the ledge of rock, at 1.25 p.m., where I decided to stay a day to collect. The descent to the river was steep and difficult, but this time the river itself offered no dangers and difficulties comparable with those of a few days before, as the water had gone down. Weather fine until 3 p.m., when the usual rain set in.

*Sunday (Palm Sunday), March 26th.* Although the temperature at night time here was only very little higher than in the upper camp (63°-65°, as against 60°-64°), we found the change very noticeable and most agreeable. I mended my camera by substituting a piece of oiled paper for the ground glass broken some days before, and took a few views of camp and river. Then we went collecting, the men bringing in a good deal.

*Monday, March 27th.* Lowest temperature during the night 64°; at 6.30 a.m. 65°. I took some more photographs, and we started for Kiou at 9.30 a.m., the progress through the river being very easy. We reached the open field at 9.50 a.m., and Kiou at 12.30 p.m. [Two of the photographs are here reproduced, both taken from the same point, but one looking up, the other down, the Kadamaian River. Within the bed of this river our route lay for a considerable distance up and down Kina Balu. But on the day when these photographs were taken, the water was considerably lower than on March 21st and 22nd when we went up the mountain.]

*Tuesday, March 28th.* Early in the morning I went with De Fontaine to the top of Kiou hill to take some photos of Kina Balu, but found it hazy and the sun standing just above the mountain. We waited for matters to improve, and climbed about in search of a favourable spot, finding the heat of the morning scarcely bearable. Finally we took a few views, and returned to Kiou, hot and tired. Then after calling the coolies together, we left the village at 10.30 a.m., went down a steep descent,

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proceeded along our former path, and got a view of the picturesque village of Lobang, perched on a hill in front of us, and, like most of the villages here, fringed round with coco-nut palms. We passed below the village, and reached the river Lobang at 11.45 a.m. We had to ford it as before, and most of the men as usual took the opportunity of having a proper bath, but, for the first time during the expedition, I felt myself disengaged for the exertion. Rain set in soon after, and we reached Koung at 1.55 p.m. I developed a strange dry cough in the evening, which, however, disappeared during the night.

*Wednesday, March 29th.* I had the usual trouble with the coolies before they took up their luggage. Some were scattered over the village, and with Malagup I had to go to a house on the hill to fetch the last stragglers. Whilst the men were still packing, I left Koung by myself at 8.45 a.m., wishing to proceed slowly and intending to await the others at the ford of the Tampassuk which I thought I remembered. But after half an hour's walk, I found that I had lost my way, and endeavoured to return, passing through jungle and wet grass, breast high. At last I heard the shouts of the men, and reached the ford just as the last of them were crossing. I felt pretty well exhausted, but undressed and went through the rapid river, requiring all my energy to keep my balance. When dressing again I had great difficulty in putting on my clothes which were damp with perspiration and with wading through brooks and tall grass during the last hour. I called out for help and then almost immediately collapsed in a faint, though retaining consciousness. I felt as if I had arrived at a very literal 'dead stop,' lying groaning between the boulders on the bank of the river and suffering much from cramp in my limbs. When able to speak again, I got the men to make me a bed of leaves and light a fire, and then to prepare for me a strong soup. After taking this I felt better, and when half-an-hour or so had passed, was able to get up again. A message was sent to the men in front of us to stop. De Fontaine as usual proved most helpful and equal to emergencies, as he had been throughout the whole expedition. All this happened on the left bank of the Tampassuk which, consisting chiefly of sand and boulders, was only a few yards broad and rose at once into the extremely steep Gunong

Kampil, about 2000' high. Being covered with grass only, this hill was exposed to the full glare of the sun. However, I decided to push on to our next stopping place, Bungol, rather than return to Koung, but progress was exceedingly slow, as after every twenty yards or so of climbing I had to rest. After an hour's time I took a tin of Brand's Essence of Beef, and in another hour a cocktail, and, with the help of a man in front of me, who pulled me up with his stick, I progressed better. The men were most patient and stopped every time with me. At about 2 o'clock the sky darkened, affording at least some protection against the burning sun, and finally the usual thunderstorm broke forth, but with abnormal violence. Still climbing and quite drenched, we reached a little broken-down shed where some of the men, with most of my private luggage and the tent, were awaiting me. Most of the party, however, including Malagup, had gone on to Bungol. Here I partook of more refreshment, and feeling very much better by this and probably also by the cooling rain, I, after a little rest, astonished and amused my men by shouting out 'lakas, lakas' when they were taking up their things at 4.15 p.m. The ascent continued, so did the pouring rain, and finally, near the top of the mountain, we entered thick jungle. Lightning and thunderclaps were now frequent, and were greeted with yells by the men. Now began a slow descent along a clayey and deeply worn jungle path which in many places was transformed into a yellow stream. About 6 p.m. the rain ceased, and we approached the River Menternan with many misgivings. I knew it had to be forded before reaching Bungol, and when we arrived on the bank at 6.15 p.m., I was not surprised to find it a roaring yellow torrent, impossible to cross. But we had some hope, as from the marks along the bank we saw that it was going down rapidly after the heavy thunderstorm. So we decided to wait a little, I trying to keep myself warm by walking about. It got dark now and I lit the stump of a candle which I found in my portmanteau, and the men made long, but fruitless efforts to light a fire. Two or three of our most plucky men were daring enough to cross the river in order to go to Bungol for help and a lamp, but they did not return. Waiting and shivering with cold, we stood about till 8 p.m., when I decided to stay where I was and fix up my tent. I put

on dry clothes, wrapped myself in blankets and felt warm and comfortable, although getting only little sleep. But as the river by this time had gone down considerably, De Fontaine and some of the men managed to cross and reached Bungol in safety. Only a few Dusuns stayed with me, making as usual next to no effort to prepare a sleeping place for themselves, but remaining squatted on the wet ground, some perhaps with a few sticks between it and themselves, but in no case with protection above. My camp-bed broke down partly during the night.

*Thursday, March 30th.* I got up at 6 a.m. and found that there had actually been no rain during the night. Some of the men had already returned from Bungol to help us across the Menternan, so we left at 6.30 a.m., and as I still wore my dry and warm flannels from the previous evening, I had myself carried across the river, which we had to ford three times, and reached Bungol at 7.45 a.m. I felt the need of a day's rest, and decided to remain here, but gave directions to Malagup to proceed with the coolies carrying the luggage which was not immediately required, to Panjut, our starting place on the coast. I gave him instructions to reach there on the Saturday following, and to discharge the coolies on arrival, giving him also a letter for the district officer there to the same effect. I spent the day resting and taking notes. Dull day, drizzling rain from about 1 p.m., heavy rain from 3 p.m.

*Friday (Good Friday), March 31st.* I had a comfortable night, although only little sleep. We left Bungol at 8.3 a.m., forded the Menternan and Inuman Rivers, climbed the Gunong Kalawat, and reached Kalawat at 1.55 p.m., in fog and rain. It was a heavy day's work, ascending nearly all the time, added to which was the recollection of our march over the same ground two weeks ago, when we had found the down-hill way so easy. This time we did not attempt to camp out in this village, and I managed to get a tiny, but comfortable room all to myself.

*Saturday, April 1st.* We left Kalawat at 7.30 a.m., caught sight of the sea for the first time again at 9.40, and were overjoyed, like Xenophon and his companions. When approaching Kappa, about 2 p.m., one of the men who had been in advance came running back to say that a 'Tuan' had arrived in the village and wished to see me. It was Mr. Burls on his way to

wards Kina Balu. He told me that he had left Labuan on March 16th, and, on account of trouble with the carriers, had been detained on his way. The old Chinaman whose hospitality we had enjoyed some weeks ago in Bandaian, had turned up in Kappa before my arrival, and had informed Mr. Burls that gold was to be found one hour's walk from here. So Mr. Burls sent for the Dusun who was supposed to know the spot, and, on my advice, asked the man to fetch him a piece of the precious metal. The man promised to do so next morning at daybreak.

*Sunday (Easter), April 2nd.* At 7.30 a.m. Mr. Burls heard that the Dusun had not started as yet for the gold, but would do so after his breakfast. This was at last over, but then the Chinaman came to say that the locality was unsafe on account of an enormous snake. The Chinaman's arms were just long enough to give us an idea of this snake's diameter. We tried to allay those fears, but were then told that the gold was down a deep hole, that candles were required, and that at least three men would have to go. To my regret I had to leave Kappa in the midst of this interesting discussion, starting at 8.40 a.m. It was a nice morning, after pouring with rain all night until 6 a.m. We began the descent at 10.15 a.m., reached the plain at 10.50, the village of Menkaladai at 11.30, rested a little, and reached the Tuaran River at 2.20 p.m., one of the men taking us through a most swampy 'short cut,' between padi fields. Here we had to wait a little while for a boat, and I reached Panjut somewhat in advance of the others at 3 p.m., with feelings of profound relief. Being transplanted comparatively suddenly from the hilly interior to Panjut, in the plain and near the sea, the people here struck one at once as more comfortable and better off: they had more buffaloes, many goats, and sledges, which indeed would have been impossible inland, and better clothing, and were also oftener intoxicated, a sure sign of civilization. But there were also more flies and ants in the houses, and more mosquitoes at night time, which, however, were not very troublesome. We heard that on the day before there had been a large funeral here, on which occasion five buffaloes were killed.

*Monday, April 3rd.* As I was absolutely in the dark as to when and where, whether in Gaya or in Labuan, we should be

able to catch a steamer to take us to Singapore, I sent De Fontaine to Gantian to make enquiries. I spent the day taking notes, the coolies and crowds of villagers as usual standing and squatting round me, and watching every movement, nearly distracting me by their continuous coughing. But I found some music going on in a neighbouring house very soothing.

*Tuesday, April 4th.* De Fontaine came back at 7 a.m., after having travelled part of the night, bringing the dismal news that a coasting steamer had left Gaya for Labuan at midnight. This really made no difference in the end, however, as we heard later on that this boat had no connection in Labuan with boats for Singapore. He had brought with him a large rowing boat, and so I decided to leave at once for Gantian. We started from Panjut at 8.30 a.m., reached Berunggis at 9.15, left there by boat at 9.30, and reached the district office of Menkabong, at the mouth of the Menkabong river, at 12.30. Here we had a rudimentary tiffin, left again at 2 p.m., and, rowing and sailing, reached Gantian at 4.53, p.m. It was a very trying journey: the day was hot and cloudless, and we sat in an open boat cramped between piles of luggage. To my regret, I found Mr. Haynes, who in the meantime had shifted from Gaya to Gantian, down with liver, but Mr. Keasberry kindly took charge of us and put us up in an unfinished wooden house intended for the native clerk. The carpenters with their boards and wood shavings lying about were cleared out in a few mintues, and we established ourselves there in a rough and ready fashion.

*Wednesday, April 5th.* No work done, all feeling the need of a day's rest. I saw some newspapers, for the first time for about a month.

*Thursday, April 6th.* I hired a native boat and went out at 6.30 a.m. to the reefs where I did some collecting, chiefly corals, a native diving for them, and spent the greater part of the day in cleaning and bleaching the corals. A coasting steamer brought the welcome news from Mr. Little, Labuan, that two gentlemen, Messrs Lower and Pavitt, would arrive in Gaya on Sunday next with the steam-launch 'Sri Putri,' and could take me down to Labuan just in time to catch the 'Hecuba' for Singapore. De Fontaine was ill this day.

*Friday, April 7th.* I collected more corals, and De Fontaine went out shooting birds and squirrels. There were strange rumours about : trouble was expected with the natives in the neighbourhood, and rough defences, consisting of breast-high boarding with sand between and plenty of barbed wire outside, were erected around the offices. We noticed several little colonies of natives settling down on the shore of the bay just to the north of Gantian, having left their homes out of fear.

*Saturday, April 8th.* We spent the day in packing and preparing for our return to Singapore.

*Sunday, April 9th.* Messrs Tower and Pavitt arrived here at 8.45 a.m., and informed me of the arrival of their steam-launch in Gaya. I reached Gaya at 12.15 p.m., and we all left for Labuan at 4.40 p.m.

*Monday, April 10th.* We anchored during the night off Pulo Tiga, reached Labuan at 10.53 a.m. and put our luggage on board the 'Hecuba'. I went to see Mr. Little, made two or three calls and returned to the 'Hecuba' which was to sail at 4 p.m. On my way down to the boat I found the place in great excitement as Governor Beaufort was leaving by her for Singapore, bound for Europe. The natives expressed their farewell good wishes by firing off crackers, and by music and processions. Also a large party of Europeans came on board to see H. E. off. The boat left at 5.15 p.m.

*Tuesday, April 11th—Thursday, April 13th.* At sea. Pleasant passage.

*Friday, April 14th.* We anchored off Singapore soon after midnight, and landed at Johnston's Pier at 7.15 a.m.

#### General Remarks.

*Barter and Coinage.* When preparing for my expedition I was in doubt as to whether I should take with me a supply of barter, as Spenser St. John, Whitehead, and others had done, but was afterwards glad that I had abandoned the idea. The things I would have taken would certainly have been almost useless. What we were asked for in every village to and from Kina Balu was kerosine oil, and the natives always annoyed us by bringing large vessels in the hope of sharing our little supply. Next in demand were soap and matches. Only once in Kiou were we

asked for cloth and red beads. Thus, with the exception of the last, it is the necessaries of life which would seem to be required, not trifles, though the red beads, as universally worn by the women, may almost also be regarded as necessities. Instead of barter I had supplied myself with plenty of small silver, but was highly astonished to find these coins were almost unknown; even Malagup, the Dusun chief, living in a comparatively rich district on the coast close to where a large fair is held once or twice a week, did not know the value of a 5-cent piece. These coins were always accepted with distrust, except by a young man in Bangol who had a collection of them. But he had lived in Kudat for some time and spoke Malay fluently. On the other hand, notes (B. N. Borneo has notes down to the value of \$1, 50 cents, and 25 cents), silver dollars, and copper cents were always acceptable, copper being apparently the chief currency, though the natives were glad when they could exchange their copper savings for silver dollars with us. In great demand also were the empty provisions tins, especially those with lids, and it was amusing to see the scramble when one threw an empty condensed milk tin away.

*On the March.* We generally started at 8 a.m. and reached the next stopping place about 2 p.m., the villages being at convenient distances from each other. The weather as a rule was fine in the morning, but rain set in nearly always in the early afternoon, so that we seldom reached camp without getting wet. However, this made little difference, as we were often soaking wet from fording the rivers. Naturally we always changed on reaching camp and made an attempt to dry our things, but they were generally still wet on the next morning, and when setting out on our march we always put on the wet things from the day before, feeling only little discomfort. There is a narrow path from Panjut right up to Kiou, just wide enough for one man, but broadening out in the neighbourhood of the villages, and of course branching off here and there. It runs for a considerable distance along the top of the mountain ridges, rather provokingly following every one of their curves, but having the advantage of a free outlook for ascertaining one's whereabouts. Paths along the rivers on this route were exceedingly rare, thus differing essentially from the Tampassuk

route to Kina Balu. After Kiou the path continued in the usual way, became somewhat indistinct after we had left the Kadamaun-River, but was more noticeable here and there from old camping places and traps for birds and smaller game set at intervals.

*Life amongst the Natives.* We found the Dusuns very good-natured and harmless people, and quite honest until the last day in Panjut when our kerosine oil disappeared for a few hours and some other trifling things for ever. They were certainly somewhat lazy in the morning, and there was generally a great deal of grumbling before they took up their loads, but when once started, they left little to be desired, and showed themselves splendid carriers especially on hilly ground. Very annoying was their intense curiosity: when we arrived at a village, not only our carriers and the people of the house with their immediate friends, but all the village came and stood there, several rows deep, around us. We could not change our socks or any other part of our dress without themselves and their women and children taking stock of every movement and every article. It was the same when the cook prepared my meals or when I partook of the same, when I wrote my notes or bottled specimens, when I undressed at night-time and disappeared behind the mosquito-curtain, everything formed food for their admiration and amazement. Sometimes when I sat perfectly still without doing anything, their attention relaxed, but my slightest movement had the effect of the curtain rising at the Pantomime, the eyes and open mouths of all present were directed to one point. No box or portmanteau could be opened without every one rushing to see what it contained. When I awoke in the morning I was sure to find people squatting round my camp-bed who had apparently been anxiously waiting for signs of my awaking. The worst was that it was impossible to escape from it: as, once arrived at a village at about 2 o'clock in the afternoon, we changed, and as we nearly always had rain from that hour and the neighbourhood of the houses was a mass of filth, accumulated ever since the houses had been built, we did not care to go out and get wet and dirty again. The inside of the houses was at least dry and fairly clean, the floor, raised about five feet above the ground, being formed of split bamboo, in

many cases covered by rattan matting, and in a few cases the owners of the houses brought me a special mat to sit upon. The space below the houses was generally inhabited by pigs, but though they grunted day and night, it did not interfere with our peace. Much more annoying was the continuous coughing of the people, many of them seeming to suffer from chronic colds. Taken altogether, the stay in the Dusun houses was far from pleasant, and on dull days exceedingly dreary, but, after our experience at Kalawat, it was preferable to camping in the open.

*Food.* As I mentioned before, the last padi crop was a failure in N. Borneo, but even in prosperous years it would probably be impossible to get sufficient rice from the different villages for a large body of carriers, and on this occasion people did not even like to sell a few cents' worth. In the district we visited communication is a matter of intense difficulty, everything has to be carried by man, the hilly parts are quite impassable for bullocks, and the rivers are torrents along which even the smallest crafts could not find a passage except for a few hundred yards at a time. However, in almost every village I was able to get fowls and eggs for my own consumption, the former ranging in price between 10 and 20 cents, sometimes even less, and eggs from 1 to 2 cents. But large parties would probably have been unable to get sufficient. Milk was unknown. Coco-nuts we got in every village free of charge, and they were always welcome. There was practically no house without a group of coco-nut and betel-nut palms close by. Two or three times we got Langsats, which seemed to grow half wild, especially near Koung. They were very refreshing, but unusually sticky.

### Scientific Results.

#### MAMMALS.

From the list given below it will be noticed that no big game was obtained during the expedition. The largest mammal seen was a black long-tailed monkey, probably *Semnopithecus femoralis*, observed near Gantian. However, in the mountain jungle between Kappa and Kalawat, we passed several traps which we were told were intended for Tembadaus (*Bos sondaicus*).

These traps consisted of two rows of substantial upright poles rammed into the ground and converging at one end, the other end being open and continuous with the jungle path, so that the animal once entered would jam itself between the poles at the far end of the traps. Traps for small mammals, as figured by Burbidge (4), p. 87, and Whitehead (10), p. 167, were frequently seen on Kina Balu, and most of our mammals were obtained with them. The only mammal we saw in anything like numbers was the bat *Cynopterus lucasi* which made its appearance generally late in the afternoon at our upper camp, 4,200'. The following is a complete list of the mammals obtained.

- Cynopterus lucasi* ♂ ♀ Kina Balu, 4,200'.
- Scotophilus temminckii* ♀ Kappa.
- Tupaia ferruginea longipes* ♂ Kina Balu, 4,000'.
- Crocidura fuliginosa* ♂ Kina Balu, 4,000'.
- Gymnura (Hylomys) snilla* ♀ Kina Balu, 2,100'.
- Sciurus brookei* ♂. Kina Balu, 4,000'.
- notatus* ♀. Gantian.
- prevostii* ♂. Gantian.
- Mus malleri* ♀. Kina Balu, 4,000'.
- sabanus* ♂. Kina Balu, 2,000'.
- whiteheadi* ♀. Koung.
- ephippium* ♀. Bungol.
- rattus* ♂ ♀. Several specimens on the hills and in the low lands.

#### BIRDS.

Only three common birds were obtained in the lowland near Gantian :

- Bubulcus coromandus* ♀.
- Nyctiornis amicta* ♂ ♀.
- Rhinorhtha chlorophora* ♀.

At Kion, 2,400', a female *Merula obscura*, since identified by Mr. A. L. Butler, was obtained.

#### REPTILES.

The chief prizes obtained during the expedition belong to this group, as of the 18 species collected three proved new to

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science, one of them representing a new genus, and two others new species. It is noteworthy that of only a very few species was more than one specimen obtained. The collection comprises :

CHELONIA :

*Trionyx cartilagineus*, Gunong Kalawat.

LACERTILIA :

*Gymnodactylus marmoratus*, Kina Balu, 4,200'. 8 specimens.

*Hemidactylus frenatus*, Near Tuaran River.

— — — *platygurus*, B. N. B.

*Gehyra mutilata*, B. N. B.

*Gecko rhacophorus*, n. sp. Kina Balu, 2,100'.

*Dracon cornutus*, Kiou.

*Calotes cristatellus*, B. N. B.

*Japalura nigrilabris*, Kina Balu, 4,200'. One ♂; two (♀).

*Mabuia rufis*, B. N. B.

— — — *multifasciata*, B. N. B. 3 specimens.

*Lygosoma variegatum*, Kina Balu, 2,100', and 4,200'. Many specimens.

OPHIDIA.

*Stoliczkaia borneensis*, n. sp. Kina Balu, 4,200'.

*Tropidonotus conspicillatus*, Near Tamassuk River.

— — — *flavifrons*, Kina Balu, 2,100'.

— — — *suraracensis*, Kina Balu, 2,100'.

*Oreocnemis hanitschi*, n. g. and n. sp. Kina Balu, 4,200'.

*Lachesis graminea*, Kina Balu, 2,100'.

The description of the three new species as given by Mr. G. A. Boulenger, F.R.S., (3) pp. 451-453 is as follows :

*Gecko rhacophorus*.

" Head moderately large, once and one-third as long as broad; snout longer than the distance between the eye and the ear-opening, once and a half the diameter of the orbit; ear-opening round, its diameter one-third that of the eye. Body and limbs much depressed, bordered with dermal expansions; fingers

and toes fully half-webbed. Head, body, and limbs covered with minute granules intermixed with small, round, smooth tubercles; rostral a little more than twice as broad as deep, without median cleft; nostril pierced between several small scales; nine upper and ten lower labials; symphysial small, pentagonal; a series of six small chin-shields; spine-like tubercles on the sides of the head, the largest above the ear. A moderately developed scalloped membrane on each side of the body, scaled like the body and fringed on the edge. Abdominal scales flat juxtaposed granules. An angular series of preanal pores. Tail depressed, scaled like the body, bordered with a series of rounded lobes. Greyish above, speckled with darker and with wavy dark transverse lines; brownish beneath throat with darker dots."

Millim.

Total length	...	...	...	105
Head	...	...	...	18
Width of head	...	...	...	14
Body	...	...	...	47
Fore limb	...	...	...	21
Hind limb	...	...	...	28
Tail	...	...	...	40

"A single specimen from the Kaduanian River, Kina Balu, 2,100 feet."

"This species connects *Gecko* with *Ptychozoon* and stands in the same relation to the latter genus as *Hemidactylus platyurus* does to *Mimetozoon*. The lesser development of the parachute-like lateral membrane and the absence of differentiation in the lepidosis of that membrane, justify its allocation to the genus *Gecko* rather than *Ptychozoon*."

#### *Stoliczkaia borneensis.*

"Rostral moderately large, triangular, not visible from above; a pair of very narrow internasals; a pair of large prefrontals, separated from the frontal and supraoculars by a series of small scales; frontal a little broader than long, a little shorter than the parietals; supraocular very small; eye very prominent, with vertically subelliptic pupil, surrounded by the supraocular, two or three preoculars, the fifth labial, and seven or eight small scales; nostril very large; loreal much longer than deep;

ten upper labials, the two last longest; temporals small, scale-like; a single pair of small chin-shields, in contact with three lower labials. Scales in 30 rows, those on the vertebral region and those adjacent to the ventral shields largest, elongate rhomboidal, juxtaposed, the others very small and separated by naked skin. Ventrals 210; anal entire; subcaudals 124. Rufous, with large blackish spots, at least as large as the space between them, disposed more or less regularly in three longitudinal series; brown beneath, the shields edged with yellowish."

"Total length 750 millim.; tail 240."

"A single female specimen from Mount Kina Balu, 4,200 feet."

*Oreocalamus*, gen. nov.

"Agrees in every respect with *Macrocalamus*, Gthr., except in the presence of a pair of internasal shields."

*Oreocalamus hanitschi*.

"Snout pointed. Rostral as deep as broad, the portion visible from above measuring half its distance from the frontal; internasals half as long as the praefrontals; frontal hexagonal, once and a half as long as broad, longer than its distance from the end of the snout, shorter than the parietals; nostril close to the rostral, between a nasal and the first labial (the suture between the two shields has disappeared on the left side of the type specimen); loreal longer than deep, its lower border forming an angle wedged in between the second and third labials; one pre-and one postocular; temporals 1+2; eight upper labials, fourth and fifth entering the eye, seventh largest; first lower labial in contact with its fellow behind the symphysis; four lower labials in contact with the anterior chin-shields; posterior chin-shields shorter, in contact with each other. Scales smooth, in 17 rows. Ventrals 127; anal entire; subcaudals 26 pairs. Blackish brown above and on the outer ends of the ventral shields; belly yellowish white, with a few scattered brown dots; tail brown beneath, with a darker median streak."

"Total length 375 millim.; tail 50."

"A single male specimen from Kina Balu, 4,200 feet."

## AMPHIBIANS.

Of these we obtained fifteen different species, one of which proved new to science. Unlike the Reptiles, we obtained of most species of this group numerous specimens, until on Kina Balu we had to refuse the more common species which the men brought in. We also noticed on our march how the various species of Batrachians replaced each other as we went along. At Panjut, nearest the coast, we obtained only *Rana erythraea*, which was followed by *Rhacophorus leucomystax* at the Tuaran River, by *Rana kuhlii* on Gunong Kappa and Gunong Kalawat, by *Megalophrys nasuta* at Koung, Kion and the Kadamaian River, Kina Balu, 2,100'. Finally *Bufo leptopus*, *B. pembingensis* and especially *Rana whiteheadi* were dominant on Kina Balu. Of the latter species enormous numbers were brought in. The single specimen of *Ichthyophis glutinosus* was found lying near the bank of the Menternan River, after a heavy thunderstorm, with a great deal of sand sticking to its slimy surface.

Very interesting were the tadpoles of *Rana carolympnnum*, with their huge ventral suckers, which my men found attached to the boulders in the most foaming parts of the Inuman River where the current was so strong that we could keep our feet only with the greatest difficulty. T. Mocquard (7) in an appendix to Whitehead's 'Exploration of Kina Balu', pp. 285-286, discusses these adhesive disks and considers the tadpoles to be parasitic. If, however, he had had the opportunity of seeing these creatures alive in their natural surroundings, he would have had no difficulty in discovering the true function of those suckers, which can only be to enable their owners to hold on to a firm object in the midst of the raging torrent in which their existence commences.

The Amphibians obtained are :

*Rana carolympnnum* (tadpoles). Inuman River.

— *erythraea*. Panjut.

— *kuhlii*. Gunong Kappa and G. Kalawat.

— *inictuosa*. Koung.

— *whiteheadi*. Kina Balu, 2,100' and 4,200'.

*Rhacophorus acutirostris*. Kina Balu, 4,200'.

— *leucomystax*. Tuaran River.

*Leristia natator*. Kina Balu, 4,200'.

*Oreobatrachus baluensis*. Kina Balu, 2,100'.

*Bufo leptopus*. Kina Balu, 2,100' and 4,200'.

— *penangensis*. Kina Balu, 2,100' and 4,200'.

*Leptobrachium baluense*, n. sp. Kina Balu, 4,200'.

— *husseltii*. Gunong Kapra.

*Megalophrys nigrita*. Koung, Kiou and Kina Balu, 2,100'.

*Ichthyophis glutinosus*. Menteran River, near Bungol.

Eight specimens were obtained of the new form *Leptobrachium baluense* and Mr. Boulenger, (3), pp. 453-454, gives the following description of the one specimen submitted to him:

*Leptobrachium baluense*.

" Tongue pyriform, entire. Vomerine teeth in two small widely separated groups behind the line of the choanae. Head much depressed, nearly twice as broad as long, semicircular in outline; skin adherent to the rugose skull; snout shorter than the diameter of the orbit, not projecting beyond the mouth; canthus rostralis angular; loreal region vertical, concave; interorbital region nearly twice as broad as the upper eyelid; tympanum feebly distinct, three-fifths the diameter of the eye. Fingers rather elongate, slender, first extending a little beyond second. Foot much longer than the head; toes moderately long, slender, with a very short web at the base; no subarticular or metatarsal tubercles. The tibio-tarsal articulation reaches the shoulder. Skin perfectly smooth; a very small tubercle near the border of the upper eyelid, above the pupil. Back and upper surface of snout dark grey; posterior half of upper surface and sides of head blackish brown; a curved light streak, the concavity turned forwards, across the upper eyelids and the interorbital region, followed by a Y-shaped blackish marking; two light spots on the upper lip, below the eye; large blackish-brown partly confluent spots on the back; sides dark brown, light-edged above; limbs dark brown, with rather indistinct darker cross-bars; throat brown, belly brownish white."

" From snout to vent 65 millim."

" A female specimen, full of ripe eggs, 37 millim. in diameter, from Mount Kina Balu, 4,200 feet."

"Nearest allied to *L. Fœa*, Blgr. Distinguished by the smaller head, the distinct tympanum, the longer digits, and the absence of a large horn-like tubercle on the upper eyelid."

#### FISHES.

Only two freshwater fishes were obtained during the expedition, both from the Kadamaian River, Kina Balu, 2,150', viz.: one specimen of the remarkable *Gastromyzon borneensis* (= *Lepidoglanis manticola*) with its flat sucker-like ventral surface, enabling the animal to live in the mountain torrents, like the tadpoles of *Rana erythryptera* mentioned above; and many specimens of a new homalopteroid fish, named by Mr. Boulenger (2) *Glaniospis hanitschi*, n. g. and n. sp. He gives the following description of this fish:

#### *Glaniospis*, gen. nov.

"Head and anterior part of body depressed; snout scarcely projecting beyond the mouth, which is moderately large; five pairs of barbels—two in front of the snout, two at the angle of mouth, and one between the two nasal openings; gill-openings narrow. Body covered with small scales, head naked; lateral line present. Dorsal fin short, further back than base of ventrals; anal short; pectoral and ventral fins horizontal, many-rayed, the outer rays simple."

"Well distinguished from *Homaloptera* by the presence of a nasal barbel."

#### *Glaniospis hanitschi*.

"Depth of body  $6\frac{1}{2}$  times in total length, length of head 5 to  $5\frac{1}{2}$  times. Head scarcely longer than broad; snout rounded; eye in the middle of the length of the head, its diameter 5 times in length of head,  $2\frac{1}{2}$  in interorbital width; barbels subequal in length, twice as long as diameter of eye. Dorsal 8, commencing a little behind base of ventrals, situated at equal distance from the end of the snout and the end of the caudal. Anal 7. Pectoral as long as head, terminating at a considerable distance from the ventral. Caudal as long as head, scarcely emarginate. Caudal peduncle as long as deep. Scales extremely small, smooth; lat. l. 120-125. Yellowish brown above, with trans-

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verse dark brown spots or interrupted cross-bands; head dark olive-brown above; lower parts whitish; dorsal and caudal greyish, the latter blackish at the base; pectorals greyish olive above, white beneath; ventrals and anal white; a black spot at base of ventral."

"Total length 93 millim."

"A female contains ripe ova of large size, 2 millim. in diameter."

### MOLLUSCA.

The following land and fresh-water mollusca, as identified by Mr. EDGAR SMITH, British Museum, were obtained during expedition:

- Helicarion whiteheadi*, Godwin-Austen. Kina Balu, 4,200'.  
*Macrochlamys subconvolvulus*, Edgar Smith. Gantian and Kina Balu, 2,150' and 4,200'.  
*Macrochlamys* sp., Kina Balu, 4,200'.  
*Rhyssota brookei*, Adams and Reeve. Kappa.  
*Hemiplecta densa*, Adams and Reeve. Kina Balu, 2,150' and 4,200'.  
*Hemiplecta* sp., Kiou.  
*Trochonanina kinnabaluensis*, Edgar Smith. Kina Balu, 2,150' and 4,200'.  
*Chloritis tomentosa*, Pfeiffer. Kiou. Kina Balu, 2,150'.  
*Amphidromus adamsi*, Reeve. Kina Balu, 2,150'.  
*Leptopoma sericatum*, Pfeiffer. Kina Balu, 2,150' and 4,200'.  
— *undulatum*, Metcalfe. Kina Balu, 4,200'.  
*Microparmarion siurothi*, Collinge and Godwin Austen. Kina Balu, 2,050'.  
*Pterocyclus tenuilobatus*, Metcalfe. Kina Balu, 2,150'.  
*Cyclotus trusanensis*, Godwin Austen. Kina Balu, 4,200'.  
*Dgakia* n. sp.? Kina Balu, 4,200'.  
*Lugochalus kinnabaluensis*, Edgar Smith. Kina Balu, 4,200'.  
*Pythia scarabaeus*, L. Gantian.  
*Melania episcopalis*, Lea. Menternan River.

### INSECTS.

All the Insects I obtained, with the exception of the Lepidoptera, were sent to Dr. Sharp who kindly identified all the known species. The collection, however, contains, especially

amongst the Orthoptera, quite a number of species which, according to Dr. Sharp, are probably new, and their identification is unavoidably left for some future occasion.

Some of the most remarkable Insects on Kina Balu, 4200', were certain forms which Dr. Sharp considers to be coleopterous larvae, probably of *Lycides*. They were constantly brought in by my men in handfuls, and I collected them myself on the ground, on rotten pieces of wood, and on low shrubs. These larvae resemble in many points certain larvae which I collected on Bukit Timah, Singapore, and on Maxwell's Hill, Perak, and which, according to Dr. Sharp, belong to another species of *Lycides*. It is apparently this form from the Malay Peninsula which is figured by C. J. Gahan, NATURAL SCIENCE, Vol. VII (1898), p. 43, in an article on the carboniferous *Dipeltis*. Since, however, Gahan's figure is not accompanied by a description and since, as far as I know, the larva from the Malay Peninsula has never been described, I have thought it advisable to give the following description of it.

The animal is remarkably flat and leaf-like, only a few parts of its body exceeding 1 mm. in thickness, the greatly expanded lateral portions of the thorax being even thinner. The head is very small, 1·5 mm. across, and can be retracted within the cavity of the prothorax, and is always so in dead specimens. Eyes very small, black. Both maxillary and labial palps are cone-like structures, with four and three joints respectively, the basal joint in each being very much broader than the distal joint. Mandibles small. The antennae are very short club-shaped bodies, about 0·68 mm. in length and 0·5 mm. in greatest thickness. There is a chitinous ring round the narrow base, distally followed by a crown-like chitinous structure, consisting of a broad ring from which four lobes arise lying close round the 'club.' In the living specimen, the antennae often appear as if they themselves were retractile, but as at the slightest disturbance the entire head is withdrawn inside the tubular cavity of the prothorax, and the antennae are so very minute, nothing definite could be ascertained. The prothorax is somewhat triangular, about twice as broad as long; both mesothorax and metathorax are nearly three times as broad as long, and the posterior border of the metathorax is deeply concave. Of the abdomen, nine segments are visible ex-

ternally, and its length is only about that of prothorax and mesothorax together. The width of the first segment is two-fifths that of the metathorax, that of the last segment one-fifth. The prothorax bears dorsally two tubercles, about equidistant from the middle line and the side, and slightly nearer the posterior than the anterior margin. The mesothorax bears two pairs of tubercles, an anterior and a posterior, the posterior pair being situated near the centre of each half of the segment, and the anterior pair at equal distance from the posterior pair and the anterior margin of the segment, and nearer the middle line; the metathorax also has two pairs of tubercles, placed like those of the mesothorax. The first eight abdominal segments bear three pairs of spines each, viz. one pair of lateral ones (shown in Gahan's figure), and two pairs of ventral ones; the last segment has lateral spines only.

Colour: the thoracic tubercles are black, and the tips of the ventral spines are yellowish. The rest of the body is uniformly deep chestnut brown.

Size: length of the largest Singapore specimen 41 mm.; of the largest Perak specimen 49 mm.; greatest width (metathorax): 21 mm. in both cases.

Hab: mountainous jungle of Singapore and Malay Peninsula. Rare.

The Kina Balu larva differs from this one (1) in the proportions of its dimensions, the thorax being narrower, and the abdomen longer and broader; (2) in the position of the thoracic tubercles, which are always placed in one row and close to the posterior margin of the segments; (3) in the presence of abdominal tubercles, viz., two in each of the first eight abdominal segments, also placed close to the posterior margin of the segments; (4) in the structure of the antennae, which, although of the same size and shape, and having also a narrow chitinous ring round their base, have the crown-like chitinous structure at their distal end divided, not into four, but into 12 narrow finger-like lobes; (5) its colour, being of a lighter chestnut brown, with an orange line along the sides of the thorax, the tubercles and feet also being orange. The number of thoracic tubercles and abdominal spines is, however, the same in the two species.

No luminosity was observed in either species, although I

had the one from the Malay Peninsula alive for several weeks, and was able to watch the Kina Balu one for several nights, as much of the material brought in had to be rejected and the larvae were crawling about near our camp.

A tabular statement of the chief points of difference may be useful :

	<i>Malay Peninsula form.</i>	<i>Kina Balu form.</i>
Length :		
total	49 mm. (P)	41 mm. (S)
thorax	27	25
abdomen	22	16
Width :		
metathorax	20·5	21
abdomen	10	9
Tubercles :		
prothorax	two near centre	two near post. edge.
mesothorax	four do.	four do.
metathorax	four do.	four do.
abdomen	none	two in first 8 segments.
Antennae :		
chitinous crown	four lobes	twelve lobes
Colour :		
general	dark chestnut	light chestnut.
edge of thorax	do.	orange
tubercles	black	do.
feet	dark chestnut	do.
spines	do.	do.
Occurrence :	rare	common (4200', March 1899).

NOTE : 'P' and 'S' refers to the largest specimens obtained in Perak and Singapore respectively.

On Kina Balu, 4200', I also found two specimens of another form which bore some superficial resemblance to the larvae described above, but which I now consider to be adult females of some beetle, as they are luminous. Dr. Sharp (Cambridge Natural History, Vol. VI, p. 251) refers to a paper by Haase (Deutsche Ent. Zeitschrift, Vol. XXXII, 1888, pp. 145-167) where an extraordinary light-giving larva-like adult female beetle from South America is described (*Phengodes hieronymi*). The Kina Balu

form has, however, except for its luminosity and absence of wings, little resemblance to the S. American form, and rather recalls an *Oniscus* in its oval shape and uniform segments, although its body is more elongate. Its head is small and black. Mouth appendages normal; mandibles long, thin, curved, and crossing each other in repose. Antennæ with four joints each: length of first joint, 2 mm., of second 1 mm., of third 4 mm., of fourth 1 mm.: first and second joints and proximal half of third joint white, distal half of third joint black, fourth joint yellow and covered with setæ. Eyes small (0·5 mm. diameter), placed behind the base of the antennæ. The body is much depressed, with little difference between the segments of the thorax and abdomen. The larger of the two specimens captured is 60 mm. in length (prothorax 12, mesothorax 7, metathorax 6, abdomen 33 mm.), 18 mm. in greatest width (metathorax), 7 mm. in greatest thickness. The terga are slightly arched and entirely smooth; colour black, with a narrow white marginal border on the prothorax which is continued and widens posteriorly until, in the eighth abdominal segment, only a small black patch is left in the centre of its posterior margin. The last segment is small, 4 mm. across, and entirely black. The legs are black, with the exception of the tibiae; the first seven and the ninth sternum, the chitinous patches around the thoracic (prothorax and mesothorax) spiracles and those around the first seven abdominal ones are also black; the rest is white, viz., the eighth sternum, except for a black cross, the membranous portions between the sterna, the tibiae, and especially also the circular area around the eighth abdominal spiracle. In this oval white patch, measuring 3·5 by 2 mm., the luminous organ is situated, and the light given off by it is of an extraordinary brilliancy. I had one of these larvæ alive for nearly a week, and enclosed in a glass-tube, it served me as a night light during the long sleepless nights on Kina Balu.

Dr. Sharp to whom I submitted this species for identification, marked it 'Larva of *Lampyrides*, unknown,' but on account of its luminosity I venture to regard it as an adult female, similar to the S. American form mentioned above. The absence of sufficient material for dissection, however, makes a final decision impossible.

The following is a list of the Orthoptera, Coleoptera and Rhynchota as identified by Dr. Sharp.

## ORTHOPTERA.

- Discotettix belzebuth*, Kina Balu, 2,100'.  
*Marmessoidea* n. sp. Bungol.  
*Clitarchus* n. sp. (No. 1) Kina Balu, 2,100'.  
*Clitarchus* n. sp. (No. 2) Kiou, 2,400'.  
*Hierodula birivia*, var. *minor*, Koung.  
*Deroplatys exsiccata*, Kiou.  
*Tenodera aridifolia*, B. N. B.  
*Panesthia* sp. (near *P. javana*), Kina Balu, 4,200'.

## COLEOPTERA.

## LAMELLICORNIA:

- Acerainus* sp. (near *A. borneanus*). Kina Balu, 4,200'.  
 \_\_\_\_\_ sp. (near *A. grandis*). B. N. B.  
 \_\_\_\_\_ n. sp.? Kina Balu, 4,200'.  
*Catharsius molossus*, ♀. Kappa.  
*Chalcotheca auripes*. Kina Balu, 2,100'.  
 \_\_\_\_\_ *spathulifera*, ♀. Kiou, 2,400'.  
 \_\_\_\_\_ sp. (called *C. pomacea* by Heyne). Kina Balu, 2,100'.  
*Lachnostenus* sp. Kina Balu, 4,200'.  
*Leucopholis* sp. Kiou, 2,400'.  
*Milon* sp. ♀. Kina Balu, 2,000'.  
*Odontolabis brookeanus*. ♂ ♀. Kiou, 2,400'.  
*Trichogomphus milon* (?) ♂. Bungol.  
 \_\_\_\_\_ sp. B. N. B.  
*Westwoodia* sp. (near *W. howitti*). Kiou, 2,400'.  
 \_\_\_\_\_ sp. Kina Balu, 2,000'.  
*Xylotrupes gideon*, var. ♀. Kiou, 2,400'.

## CURCULIONIDÆ:

- Cyrtotrichelus* sp. Kiou, 2,400'.  
*Macrocheirus* sp. Kiou, 2,400'.  
*Protocerus colossus*. Koung.  
*Rhynchophorus* sp. Kiou, 2,400'.

## BRENTHIDÆ:

- Entrachelus temmincki* ♂ ♀. Kiou, 2,400'.

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LONGICORNIA :

- Apriona flavescens*. Kiou, 2,400'.  
*Batocera titana* var. Koung.  
*Epepeotes luscus*. Kiou, 2,400'.  
*Palimnia tessellata*. Kiou, 2,400'.  
*Thysia wallichii*. Kiou, 2,400'; Kina Balu, 2,000'.

PHYTOPHAGA :

- Anisodera sheppardi*. Kiou, 2,400'.  
*Aplosongx* sp. Kina Balu, 2,100'.

EROTYLIDÆ :

- Triplatoma macleayi* var. Kina Balu, 4,200'.

ENDOMYCHIDÆ :

- Eumorphus quadrinotatus*. Kina Balu, 2,100'.

RHYNCHOTA.

- Tacuna speciosa*. Kiou, 2,400', and Kina Balu, 4,150'.  
*Cryptotympana aquila*. Kiou, 2,400', and Kina Balu, 2,150'.  
*Dundubia rugivera*. B. N. B.  
*Cosmosearta viridans*. Kina Balu, 2,100'.  
*Pycanum pretiosum*. Kiou, 2,400'.  
*Tessaratoma malaya*. Kiou, 2,400'.  
*Eusthenes robustus*. Kina Balu, 2,000'.  
*Prionolomia heros*. Kina Balu, 4,200'.  
*Laccotrephes ruber* (?). B. N. B.  
*Flata (Paciloptera) circulata* (?). Kion.

LEPIDOPTERA.

The specimens collected during the expedition were identified by Messrs. L. DE NICEVILLE and R. SHELFORD:—

- Hestia lynceus*, Drury. Kiou.  
*Ideopsis duos*, Boisd. ♂ Kina Balu, 2,000'.  
*Danais intensa*, Moore. ♀ Kina Balu, 2,000'.  
— *crowleyi*, Jenner Weir. ♂ Kina Balu, 4,150'.  
— *aspasia*, Fabr. Kina Balu, 2,000'.  
— *septentrionis*, Butl. Kina Balu, 2,000'.  
*Mycalensis orseis*, Hew. Kina Balu, 2,000'.

- *polydecta*, Cram. Kina Balu, 2,000'.  
 — *janardana*, Moore. Kiou.  
 — *pitama*, Staud. Kiou.  
*Ypthima pandocus*, Moore. Kina Balu, 2,000'.  
 — var. *corticaria*. Kiou; Kina Balu, 2,000'.  
*Amnoscia baluana*, Fruhstorfer. Kina Balu, 2,000'.  
*Thaumantis odina*, Godt. ♂ Kiou.  
*Tenaris occulta*, Grose Smith. Kiou.  
*Clerome besa*, Hew. Kion.  
 — *kirata*, De Nicéville. Kiou.  
*Xanthotenia busiris*, Westw. Kina Balu.  
*Vanessa perakana*, Distant. Kiou.  
*Symbrenthia hippocelus*, Cram. ♂ Kiou; Kina Balu, 2,000'.  
 — *hypselia*, var. *belunda*, Staud. Kina Balu, 2,000'.  
*Euthalia ambalika*, Moore. Kiou.  
*Chersonesia rahria*, Moore. Kiou.  
*Neptis leucothoe*, Cram. Kiou.  
*Athyma kresna*, Moore. Kiou.  
*Cethosia hypsea*, Doub. and Hew. ♂ Kina Balu, 2000'.  
*Cynthia deione*, Erichson. Kina Balu, 2,000'.  
*Manto martina*, Hew. Kiou.  
*Sinthusa amata*, Dist. Kiou.  
*Sithon kiana*, Grose Smith. Kina Balu, 2,000'.  
*Rapala sphinx*, Fabr. Kiou.  
*Leptosia xiphia*, Fabr. Kina Balu, 2,300'.  
*Delias parthenia*, Staud. Kiou.  
 — *eumolpe*, Grose Smith Kiou.  
*Terias hecabe*, L. Kina Balu, 2,000'. Kiou.  
*Hephina* (= *Appias*) *hespera*, Butl. Kina Balu, 2,000'.  
*Ornithoptera andromache*, Staud. Kiou.  
 — *brookeana*, Wallace. ♂ Kina Balu, 2,150'.  
 — *ruficollis*, Butler. ♂ Kiou.  
*Papilio procles*, Grose Smith. Kina Balu, 2,000'.  
 — *stratiotes*, Grose Smith. Kina Balu, 2000'.  
 — *scateri heurtonii*, Westwood. Kina Balu, 2,000'.  
 — *mennon*, L. (m.) Kiou.  
 — *helenus*, var. *palawanicus*, Staud. Kiou; Kina Balu, 2,000'.  
 — *delesserti*, Guerin. Kiou.

*Hasora mus*, Elwes. Kina Balu, 4,150'.

*Telicota bambusa*, Moore. Kiou.

*Odontoptilum pygela*, Hew. Kina Balu, 2,000'.

#### MYRIAPODA AND ARACHNIDA.

Some of the specimens obtained in these groups were identified by Dr. Sharp as follows :

##### CHILOPODA :

*Scolependra sexspinosa*. Kina Balu, 2,150'.

##### DIPLOPODA :

*Spirorbis baliensis*. B. N. B.

*Zephronia* sp. (near *Z. reveretti*). Kina Balu, 4,200'.

*Stenoniodes baliensis*. Kina Balu, 2,150'.

##### SCORPIONINA :

*Charinus leucostomus*. Kina Balu, 4,150'.

##### PEDIPALPI :

*Thelyphonus* sp. (near *T. klugi*). Kina Balu, 4,150'.

##### PHALANGINA :

*Sagrella* sp. Kina Balu, 2,100'.

##### ARANEINA :

*Gasteracantha rittula*. B. N. B.

— *fornicata*. Kiou, 2,400'.

*Hervennia ornatissima*. Kiou, 2,400'.

#### FRESHWATER CRUSTACEA.

One species of prawn and three species of crabs were obtained. One crab, *Potamon consobrinum*, was common in the Kadamaian River a few yards from our camp on Kina Balu, 2,100', where it lived in the crevices of the rock just below the water. The men caught them by holding bait at the mouth of these crevices. The following list gives the species and the number of specimens collected :

*Potamon pilimanus* de Man. 1 specimen.

*Potamon convexum* (de Man). 2 "

*Potamon consobrinum* de Man. 26 "

*Potamon kadamaianum* n. sp., 1 "

Mr. Borradaile to whom one or more specimens of each species were submitted, reports as follows :—" Each of the three known species is already recorded from Borneo ; and the new

one is allied to a form found in the island by the Dutch Central Borneo expedition."

Suborder MACRURA

Tribe CARIDEA.

Family PALÆMONIDÆ.

Genus PALÆMON.

1. "PALÆMON (MACROBRACHIUM) PILIMANUS de Man.

*Palæmon pilimanus*, de Man, Notes Leyd. Mus. i. p. 181 (1879); Veth's 'Midden Sumatra,' Crust. p. 4, pl. ii. fig. 2 (1882).

*Palæmon (Macrobrachium) pilimannus*, Ortmann, Zool. Jahrb. x. Syst. p. 735, pl. xlvi. fig 9 (1891); de Man, Notes Leyd. Mus. xx. p. 158 (1898).

The single specimen, which is from the Immuan River, between Kalawat and Bungol, British North Borneo, differs from Ortmann's figure in having the submedian spines of the telson considerably shorter; it is very possible, however, that the ends of these have been worn or broken off."

Suborder BRACHYURA.

Tribe CYCLOMETOPA.

Family POTAMONIDÆ.

Genus POTAMON.

2. "POTAMON (PARATHELPHUSA) CONVEXUM (de Man).

*Parathelphusa convexa* de Haan, de Man, Notes Leyd. Mus. i. p. 63 (1879); Max Weber's 'Reise Ned. O. Ind.' ii. p. 302 (1892).

*Potamon (Parathelphusa) convexa*, de Man, Notes Leyd. Mus. xx. p. 142 (1898).

The single specimen seems, by the following characters, to belong to this species.

- i. There are two epibranchial teeth on each side.
- ii. There is a spine near the end of the merus in the walking legs.
- iii. The distance between the tip of the postorbital tooth and that of the first epibranchial tooth does not exceed the distance between the first and second epibranchial teeth.
- iv. The outer edge of the first epibranchial tooth is strongly convex.
- v. There are no spots on the carapace or limbs.

The dactyles of the walking-legs are rather shorter and stouter than is indicated in de Man's figure of the allied *P. maculata*. The fingers of the chelæ are dark in colour. *P. concreta* is already recorded from Java, Timor, and New Guinea, and doubtfully from Borneo<sup>1</sup>. *P. maculata* (de Man) 1879 is a closely allied form from Sumatra.

1 ♀ British North Borneo."

3. "POTAMON (THELPHUSA)<sup>2</sup> CONSOBRINUM, de Man.

*Potamon (Potamon) consobrinum*, de Man, Notes Leyd. Mus. xxi. p. 99, pls. vi., ix., x. fig. 10 (1899).

This species is already reported from Borneo (Mt. Damoes and Upper Sibau River) by de Man. Ortmann (Zool. Jahrb. x. Syst. p. 301) gives a list of allied forms and their distribution.

2 ♂, 1 ♀ : Kadamaian River, Kina Balu, 2,100 feet."

4. "POTAMON (GEOHELPHUSA) KADAMAIANUM, n. sp.

A single female specimen of a form allied to *P. obtusipes* (Stimp.) 1858, and *P. dehaani* (Gray) 1847, seems to deserve a name of its own. Whether it were not better treated as a local race of one of the above species, or all three as local forms of *P. dehaani*, is a question to be settled when the subject of the interrelationship of the various forms in the genus comes up for discussion. In the meantime its distinctness seems quite as great as that of several of the generally accepted species. It differs from *P. obtusipes* in the greater slenderness of its legs, especially of the dactyles, which are long and narrow and end in a sharp claw.\* A *Potamon* of the subgenus *Gehelphusa* with the surface of the carapace smooth and finely pitted over the greater part of its extent, finely granular on the front, more coarsely so on the forepart of the branchial region, rugose on the hinder part of the same region; the front much deflexed, ending below the outer angles of the orbits, when viewed in front bounded by an almost straight line curving away gradually towards the outer angles;

<sup>1</sup>Miers, Ann. Mag. Nat. (5) v. p. 306 (1880).

<sup>2</sup> According to Ortmann (Zool. Jahrb. x. Syst. 300) *Thelphusa* is the correct name for the subgenus in which this species must be placed.

\* The portion defined by asterisks was by Mr. Borradaile's wish substituted for the original passage in the P. Z. S.

the median furrow of the carapace continued over the front to its anterior edge, behind each orbit a shallow triangular depression of the carapace reaching backwards through rather less than half the length of the cephalothorax and separating the branchial from the gastric region; the chelipeds subequal, similar, when fully extended outwards reaching the end of the carpopodite of the second walking-leg, the wrist and palm rugose tuberculate, the fingers rather shorter than the greatest length of the palm, the immovable finger with two ridges along the outside, the moveable with one, the wrist with a sharp point at the outer end, and a strong tooth on the inside; the second walking leg rather longer than the third, the latter longer than the first and fourth which are approximately equal, the upper edges of the meropodites of all the legs rugose, the propodosites of the walking legs somewhat longer than the carpopodites, the dactyles about equal to the propodosites, sword-like, ending in a sharp claw, and provided above and below with spines.\* The length of the cephalothorax is 15 mm. The colour in spirit is a dark brown.

*P. dehuani* has been found in Japan and the Loo Choo Islands; *P. obtusipes* in the Loo Choo Islands and the Philippines.

*P. bicristatum* de Man, 1899, is an allied species from Borneo (Mount Liang Koeboeng). In view of the peculiarities of the distribution of the genus, it seems best to choose a territorial name for the new species. That of *kndamaianum* is therefore proposed, derived from the name of the river in which the present specimen was found.

1 ♀ : Kadamaian River, Kina Balu, 2100 feet."

#### Literature.

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4. *Burridge, F. W.*, The Gardens of the Sun, or 'A Natural

list's Journal on the Mountains and in the Forests and Swamps of Borneo and the Southern Archipelago.' London, 1880.

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7. Mocquard, F., Sur une Collection de Reptiles et de Batraciens des Iles Borneo et Palawan. (Whitehead, Exploration of Kina Balu, pp. 285-286).

8. St. John, Spenser, Life in the Forests of the Far East: or Travels in Northern Borneo. 2 Vols. London, 1863.

9. Steffl, O., On the Flora of Mount Kina Balu, in North Borneo. Trans. Linnean Soc., Botany, ser. 2, Vol. IV (1893), pp. 69-263. (Contains Dr. G. D. Haviland's Narrative of his ascent of Kina Balu in 1892).

10. Whitehead, John, Exploration of Mount Kina Balu, North Borneo. London, 1893.

#### Explanation of the Plates.

N. B. Plates I and II illustrate the animals first described by Mr. Boulenger in the '*Annals and Magazine of Natural History*.' They are, however, now figured for the first time.

#### PLATE I.

- Fig. 1. *Gecko rhacophorus*, Boulenger (p. 70.)
- " 2. *Stoliczkaia borneensis*, Boulenger (p. 71.) Dorsal, ventral and lateral views.
- " 3. *Oreocalamus hanitschi*, Boulenger (p. 72.) Dorsal, ventral and lateral views.

#### PLATE II.

- Fig. 1. *Leptobrachium baluense*, Boulenger (p. 74.)
- " 1a. " " Mouth.
- " 2. *Glanioopsis hanitschi*, Boulenger (p. 75.)" Ventral view.
- " 2a. " " " " Ventral view.

#### PLATE III.

Kadamaian River, Kina Balu, 2000', Looking up. March 27th 1899.

#### PLATE IV.

Kadamaian River, Kina Balu, 2000', Looking down. Mar. 27th 1899. Taken from the same spot as Plate III.



2.



1.



2.



3.



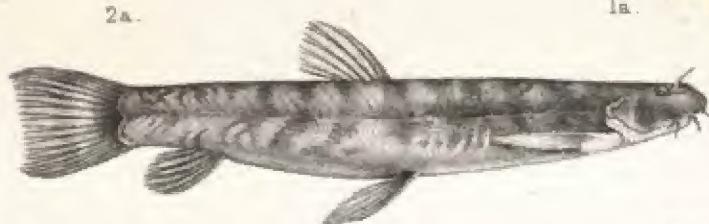
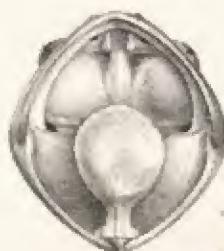
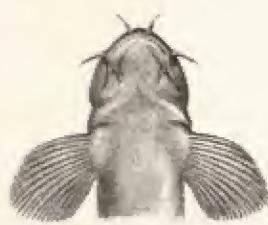
J. Green del. et lith.

1. *Gecko rhacophorus.* 2. *Stoliczkaia borneensis*

3. *Oreocalamus hamtschi.*

Entered Bros. imp.





1. *Leptobrachium baluense*

2. *Glaniospis harutschi*.



## Dammar and Wood Oil.

BY H. N. RIDLEY.

Dammar is the resin exuded from various trees when wounded. The trees producing it belong chiefly to the order *Dipterocarpaceo*, and to the genera *Shorea*, *Hopea* and *Anisoptera*, but the Malays also class as Dammar resins derived from certain species of *Canarium*, and *Triocoma* (*Burseraceae*) and *Calophyllum* (*Guttiferae*).

The resins are exuded from wounds in the trunk or branches, or sometimes a tree is hollow in the centre, and the space is filled or partly filled with the dammar, which thus forms a cast of the hole. At times it is exuded beneath the bark when it sets in the form of a plate or lamina, or it may drip slowly from a broken or cracked bough, so as to form stalactitic pipe-like masses on the injured part, and sometimes a stalagmitic mass on the ground below. The exudation does not commence immediately the wound is inflicted, and is produced very slowly, at first like turpentine, but soon setting into a hard crystalline mass. Even quite young trees, such as *shoreas*, produce the dammar when the stem or twigs are broken or bored by insects. The masses of dammar are not only modified in form by their method of production but also in colour and transparency. Many of the native and trade names have reference rather to the form and colour of the resin mass than to the tree from which it is derived. Thus Cat's-eye Dammar (*Dammar mata kuching*) is a transparent, pale, yellowish resin, usually in small pieces, and can be derived, I believe, from almost any of the *Hopeas*. *Dammar daging*, a dark brown, often handsomely marbled resin, often occurs in large masses showing the form of the hollow of the tree in which it was exuded. A very beautiful dammar of which I obtained a specimen from Jobore was a clear sea green. It was found buried in the ground as is often the case, and there was no clue as to what tree produced it. When oxidised the resin becomes opaque

and yellowish white, and rather soft and powdery. Most of the dammar found in the ground in the forests is much oxidised outside, but the action goes on very slowly, and ground dammar in good condition can often be found in spots where for many years there has been no forest or dammar trees. Thus one can often find pieces of dammar in the ground on Blakang Mati where dammar trees have long ceased to exist. The greater part of the dammar collected by the Malays is thus found by digging in the ground where *shorea*s or other dammar trees have decayed. No attempt is made to extract it from trees as is the case in wood oil. The resin is used locally for making torches, and also for varnish, but the export trade in Singapore has very much declined of late years. Cat's-eye dammar and copal from Celebes are almost the only dammars now exported from Singapore, there being no demand for the less transparent varieties. The copal which occurs in large beautifully transparent yellow masses is derived from *Shorea selanica* Bl., and is not to be confused with the African and American Copals, which are derived from species of *Hymenaea* and *Trachylobium* (*Leguminosæ*).

*Varieties of Dammar.*

The following is a list of the local names of dammars of the peninsula as far as I have been able to get them.

*Damar Seraya Batu; Damar Seraya.* A hard opaque mass of a dull orange colour, probably derived from *Shorea leprosula* Miq. *Kapong Labu* is also from this tree.

*Kapong Jalon.* A pipe-shaped mass, brown outside, inside yellow, centre dull olive brown.

*Kapong Hantu.* Dark brownish colour mixed irregularly with yellow. Both of these are derived from *Shorea macroptera* Dyer, the tree known as Kepong, as perhaps are Kapong Sabut, Kapong S'lawang and Kapong Segan.

*Meranti Bunga.* An amorphous mass nearly opaque of a whitish olive yellow mixed with greenish brown and weathering yellow.

*Meranti Sarang punai; Meranti Tembaga, Meranti Sama, Meranti Ketipa* are probably derived from *Shorea*s.

*Meranti Batu,* a dark brown weathering orange. This is very similar to the Damar Daging of the Malays, which occurs

in large masses in the ground, evidently originally exuded into the hollow of a tree and perhaps taking its brown colour from this method of production.

*Damar Mata Kuching.* Cat's-eye dammar appears as pale yellow or nearly white, quite transparent, glassy tears. It is the most valued of the local kinds. A number of trees are said to produce this Dammar, among them *Hopea globosa* Brandis, *Hopea intermedia*, King, and *H. micrantha* Hook. f. (Trans. Linn. Soc. XXIII. 160) also *Pachynocarpus Wallichii*.

*Damar Rambei* Dyer. A transparent yellow Dammar, browner in the middle, occurs in a stalactitic form, and is produced by *Shorea acuminata* Dyer.

*Damar Chingal* is from *Shorea bracteolata*, Dyer.

*Merawan Jangkar*, *Merawan jalor*, *Merawan Kunyit* are doubtless produced by species of *Hopea*.

*Damar Mersawa hitam*, by *Anisoptera glabra*, Kurz.

*Damar Mersawa putih* probably by *A. costata*, Korth.

The sea green dammar from Johor I have already described. Another unidentified kind I have met with, had been exuded from the stump of a large tree which had been felled in the Carimon islands. It formed an opaque bright yellow mass of the appearance of bee's wax. I was informed that the tree was a Keruing (*Dipterocarpus*), but I could not verify this.

Besides the Dipterocarpus resins, there are some kinds which belong to very different classes of trees, and are roughly classed as Dammars by the Malays. Among these there are several from the genera *Canarium*, *Santiria* and *Triouma*, (*Burseraceae*). The most interesting is the Kedondong Kijai from *Triouma Malaccensis*, Griff. This resin seems to set with difficulty being more of the consistency of turpentine. It is dark grey or black turning yellowish grey or opaque white with a very pleasant aromatic scent. Other resins obtained from plants of the same order are *Damar Kedondong Krut* (*Santiria* sp.) and *Kedondong Mata hari* from *Trigonochlamys Griffithii* Hook. fil. Sayang from *Santiria laru*, King. *Damar Kijai* a resin valued by the Malays, is said to be produced by *Canarium secundum* Benn.

Other resins sometimes classed as Dammars by the Malays are those exuded from wounds in various species of *Calophyllum*; *Bintangor bunga* and *Bintangor batu*, (*C. pulcherrimum*) which

produces a soft resin very sticky, of a bottle green colour when thin, and black when in mass,

*Damar minyak* is the name given to the turpentine of the large Conifer *Damara Orientalis*, which grows in the hill ranges of Penang, Perak, etc. This tree abounds in the turpentine, which is very liquid. I have seen it poured out in large quantities from cut roots of a big tree on the Thaiping hills. Cooke states that it was sold to varnish makers under the name of East India Dammar, and that it is much esteemed by natives for incense.

*Kelulut Damar*. This is a black or more rarely grey Dammar obtained from the nest of the little stingless bees known as *Trigona*. There are several species here which make dammar nests. The commonest appears to be *T. laeviceps*, a small black kind; there is also a light brown kind, and a very small black species which frequently nests under the planks in houses. In the case of *T. laeviceps*, the nest is built in a hollow tree at the entrance to which the bees build a trumpet shaped or flattened tube projecting for six inches or more from the tree. From one nest I obtained a very large cylindrical tube a foot long ending in a flat spoon shaped portion. These tubes are made of a sticky resin, too adhesive for any insect except a *Trigona* to walk over, so that enemies cannot invade the nest. The nest itself consists of an irregular mass of dammar, in which are placed the detached elliptic cells, in which is often a good deal of black honey. The mass of dammar in old nests is often very large and must represent a vast amount of work on the part of these little bees. Both the dammar and honey are sought by Malays, and used as medicine and the resin also for torches, etc. The tube at the entrance pounded up is rubbed over the body in cases of rheumatism. The presence of a Kelulut's nest in a tree is not necessarily injurious to the tree. Very large nests may occur in trees for many years without causing any appreciable injury. On the other hand it is very probable that they prevent further decay by sealing up the injured wood in dammar, and by preventing termites from effecting a lodgment in the tree. One species of Kelulut makes its nest in that of one of the termites underground usually at the foot of a large tree. There appears to have been some question as to what tree the Kelulut obtained its dammar from, as it has long been noticed (Cook's Gums and Resins) that

it was very different from any known kind of resins. The fact is that it is a mixture of all kinds of resins, indeed any resinous substance that the bees can get is collected. They quickly find any wounded resinous tree and gather as much as they can. I have seen them at work at Shoreas (*S. parvifolia*) *Garcinia*, *Calophyllum*, *Triomma* and *Anysana* (*Pterocarpus indicus*).

#### WOOD OIL.

The trees of the genus *Dipterocarpus* do not, like the allied Shoreas, produce dammar but they produce instead, wood oil, or Gurjun oil, as it is commonly called, the Minyak Keruing of the Malays. The *Dipterocarpi* are trees of gigantic size, with large pink or white sweet scented flowers and globose or four or five angled or winged fruits with a pair of long oblong wings as much as nine inches long in *D. grandiflorus* Blanco. The oil is obtained by cutting deep holes into the stem of the tree with an axe or chisel about six inches square, the top of the hole sloping inwards, and the floor excavated to hold the oil. A fire is then made in the hole so as to char the sides and top, after which the oil is exuded in considerable quantities, and collected in kerosine tins. When the oil ceases to flow, it is usual to burn the wound again, when it recommences.

This operation does not necessarily injure the tree to any extent unless it is done to excess, but natives often cut so many holes in a tree that it dies and many trees have been thus killed. As the oil-trees are usually very isolated in the forests and never occur in any great number together a very large extent of forest is required to supply a comparatively small amount of oil, and the supply is now so scanty that the natives seldom go to seek it, and the oil has nearly disappeared out of commerce.

The oil is used for varnish either alone or mixed with other substances, or for caulking boats and such purposes but it is also used to a small extent in medicine under the name of Gurjun balsam, as a substitute for a Copalba, and it is also stated to be valuable used externally and internally in leprosy. When allowed to stand the oil separates into a clear or dark liquid known as *Chaior* by the Malays and thick semi-solid resin, *Beku*.

The chief trees producing oil here, are, *Dipterocarpus grandiflorus*, Blanco. *Minyak Kering Dadeh*; *Minyak Gombang Kechil*.

The oil soon sets into a stiff light brown resin, leaving very little of the liquid (*Chaiier*). It is used for varnish either when fresh before it has time to set or mixed with other more liquid oils.

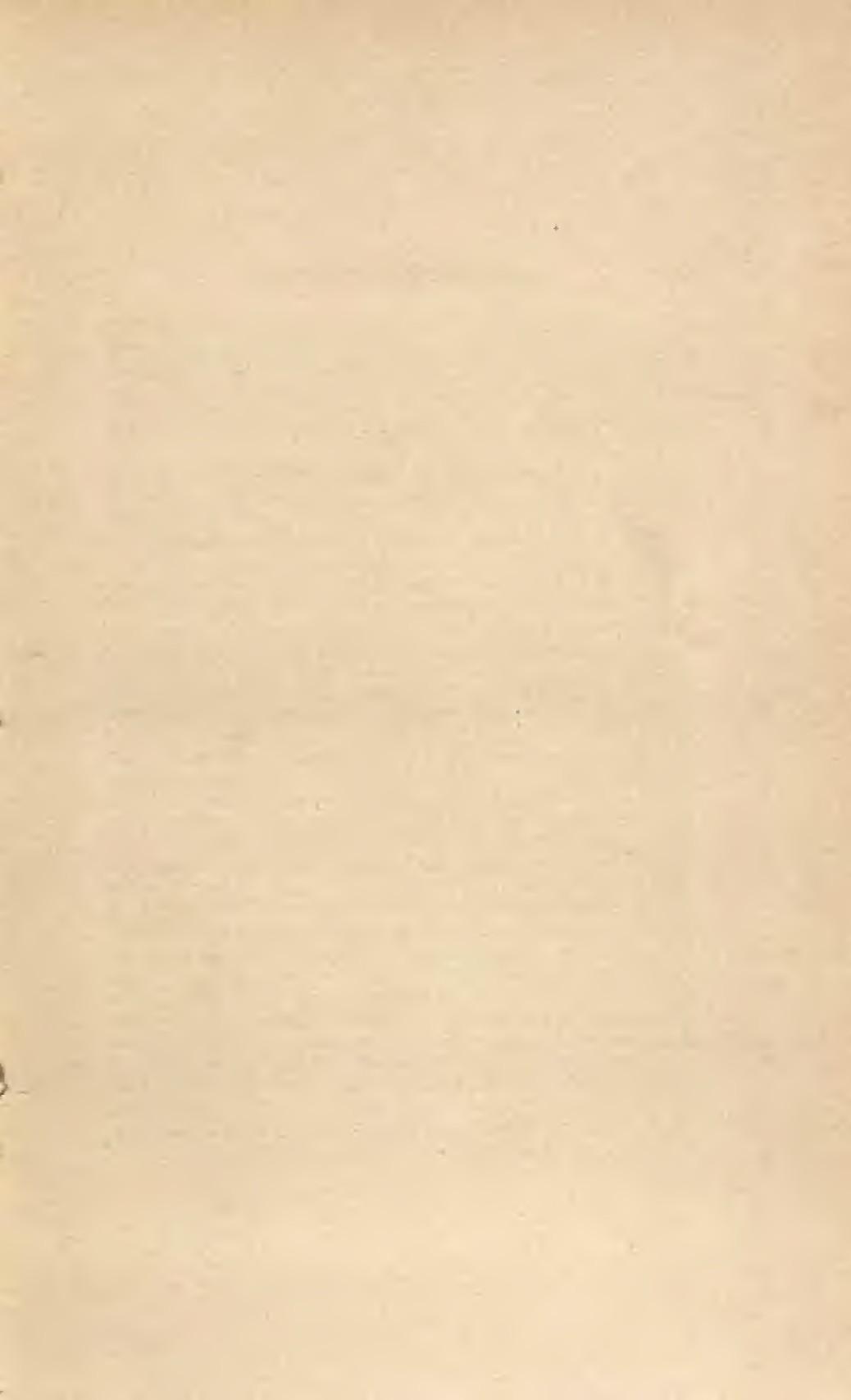
*D. Kerrii*, King. *Minyak Keruing Chaiier*. The oil is rather thin and watery of a yellow colour, and the resin is yellowish white.

*D. Hasselti* Bl. *Minyak Keruing Sudi*. The oil is of a deep brown colour, red by transmitted light with a rather stiff brown resin deposit. One of the best oil trees; it is not rare to find fruits of this in which the pericarp contains nothing but a clear transparent oil.

*D. crinitus*, Dyer. *Minyak Keruing Bulu*. This oil is considered a good kind and used for mixing with the thicker oils. The tree is commonly known as Gombang.

*Minyak Pekot*, *Minyak Merah* and *Minyak Babi* are as yet unidentified.

*D. incanus* Roxb. and *D. alatus* Roxb. occur in Siam and supply the greater part of the Siamese Wood Oils of commerce. They will probably be found in the north of the peninsula as they are found quite in the south of Siam. Siamese wood oil (probably from *D. alatus*) is very dark in colour nearly black by reflected light but yellow by transmitted light; the resin whitish. The greater part of the Wood Oils of Commerce are now exported from Rangoon, and are derived from the forests of Burmah. The trees producing them are all species of *Dipterocarpus* but all or nearly all distinct from those of the Malay Peninsula. A full account of them is to be found in Watt's Dictionary of the Economic Plants of India.



## Notes on the Flying Frog

*Rhacophorus nigropalmatus.*

BY R. HANITSCH, PH.D.

Mr. A. D. Machado, one of the most constant benefactors to the Raffles Museum, presented last year a specimen of a Flying Frog from Pahang which I have only recently been able to identify as *Rhacophorus nigropalmatus*. As only two specimens of this species have so far been recorded, the one obtained by Dr. Charles Hose from the Akan River, Borneo (see G. A. Boulenger, A. M. N. H. (6), XVI, p. 170), and the other obtained by Mr. L. Wray in the Piah Valley, Upper Perak (see S. S. Flower, P. Z. S., 1899, p. 899), this third specimen appears to deserve a special note.

Mr. Machado writes: "I caught this specimen in an old prospecting pit one morning (January 1899) at Kuala Merbau in Ulu Pahang. He had evidently fallen into it and could not get out. I found him swimming about in the water. The pit was about twelve feet deep."

The specimen shows in external characters no difference from those described by Boulenger and Flower, except slightly as regards its cutaneous fringes and coloration. The fringes of the arm seem to be more developed than in either of the other two specimens: there is one not only along the outer edge of the fore-arm continued right to the tip of the fifth finger, but also a smaller triangular one along the inner side, beginning at the proximal end of the upper arm and ending at the distal end of the fore-arm, being widest at the elbow joint. There is a semilunar flap on the tibio-tarsal articulation, as in the other specimens, and, after a break, a narrow fringe along the outer side of the tarsus to the tip of the fifth toe. A very much smaller fringe runs along the first toe. A flap of skin above the cloaca is scarcely noticeable.

When alive, the colour was a bright green above, but now, in spirit, a dark slate-grey with a purplish hue, with numerous minute white dots, isolated or in groups. There are five very conspicuous white spots on the upper surface of the thigh, one of them close to its origin, the other four a little lower down, arranged in a square. The flanks are whitish, veined with black, as in the Bornean specimen, the lower surface is a yellowish white. The enormous interdigital membranes are black near their base, but yellowish towards the edges, with yellow rays going into the black portion.

The specimen is male, its testes being very large, 15 mm. in length. The Bornean specimen was female, whilst there is no record of the sex of the Perak specimen.

Its length from snout to vent is 84 mm., against 80 mm. in the case of the Bornean and 98 mm. in the Perak specimen.

The Flying Frog of which Wallace (Malay Archipelago, 10th edition, p.30) gives such a graphic description, is *Rhacophorus pardalis* and occurs in Borneo and the Philippines, whilst a third Malayan species, *Rh. reincardii*, occurs in Java and Sumatra. Very similar species are found in Malabar (*Rh. malabaricus*), the Eastern Himalayan region (*Rh. bimaculatus*) and Madagascar (*Rh. madagascariensis*).

### Some New Eastern Gingers.

The following new species of *Scitaminea* have passed through my hands since writing the paper published in Journal No. 32 and do not appear to be described in Schumann's paper. *Alpinia pectinata* n. sp. Plant 4 to 7 feet tall. Leaves oblong lanceolate glabrous thinly coriaceous, blade 20 inches long 4 inches wide with a thick keel, ocrea obtuse. Panicle pendulous secund, with a long thick peduncle, dense with short crowded branches. Bracts many obconic half an inch long papery brown. Flowers pedicelled, pedicels in fruit:  $\frac{1}{2}$  inch long. Capsule globose trilocular  $\frac{1}{2}$  inch long. Seeds very numerous.

Celebes at Gunong Klabat 1300 to 1600 metres elevation, fruiting in January.

A remarkable plant in its one sided panicle with very short branches bearing heads crowded together, about 100 in a panicle.

The bracts which are ribbed and pubescent, resemble those of *Alpinia involucrata* on a small scale. The specimens are all in fruit. There are two undescribed species belonging to this section in Schumann's paper from Celebes.

*A (Hellenia) Celebica* n. sp. A herb more than 18 inches tall with glabrous very long pointed lanceolate leaves, 8 inches long  $1\frac{1}{2}$  inch wide, petiole terete striolate graceful one inch long ochrea oblong truncate. Panicle graceful erect branches short many flowered five inches long. Bracts caducous. Flowers  $1\frac{1}{2}$  inch long. Calyx tubular truncate  $\frac{1}{2}$  inch long. Corolla tube twice as long, lobes oblong obtuse  $\frac{1}{2}$  inch long. Lip narrow shorter than the corolla, deeply bifid, lobes spatulate emarginate. Staminodes narrow subulate. Stamen with a rather long filament, another oblong not crested. Style graceful.

Celebes.

Allied to *A Fraseriana* of Borneo, but remarkable for its very deeply cleft lip.

*Amomum terminale* n. sp. Stems crowded slender about 2 feet tall, or much taller  $\frac{1}{4}$  inch through. Leaves dark green, elliptic lanceolate acuminate thinly coriaceous pale beneath glabrous 7 inches long, 2 inches wide, petiole very short, ocrea  $\frac{1}{2}$  inch long rounded. Spike terminal or basal cylindric 4 inches long  $\frac{3}{4}$  inch through. Bracts ovate obtuse margins hairy  $\frac{3}{4}$  inch long  $\frac{1}{2}$  inch wide red. Bracteole  $\frac{1}{2}$  inch long oblong obtuse pink. Flowers in pairs. Calyx tubular dilated upwards trifid pink  $\frac{3}{4}$  inch long. Corolla tube one inch long slender white, lobes lanceolate acute  $\frac{1}{2}$  inch long. Lip three lobed, two lateral lobes shorter curved outwards, acute, median obovate obscurely lobed,  $\frac{1}{2}$  inch long. Anther with a broad connective rounded crenulate.

Bismarck Archipelago (Micholitz.) Flowered in the Botanic Gardens, Singapore, Feb. 1900.

The habit of this plant and its red bracts cause it to resemble some species of *Zingiber*, but it has not the long anther beak of that genus. It is abnormal among Amomums in having the spike terminal, but it also is said to produce basal spikes from the rhizome. It is indeed difficult to refer it to any genus but I am unwilling to make a distinct genus for it alone. In some respects it may be classed with an ornamental plant known as *Costus*

*Zebrinus* of gardens, which however has no relationship with the genus *Costus* at all.

*Tapeinocheilus Koordersiana* n. sp. A tall plant, 25 feet tall. Leaves broadly oblong nearly four feet long 8 inches wide, subcoriaceous pubescent or glabrous narrowed at the base. Spike subcylindric 8 inches long, 4 inches wide. Bracts stiff coriaceous not woody oblong or ovate cuspidate ribbed pubescent the larger ones  $2\frac{1}{2}$  inches long and one inch wide, the inner ones lanceolate cuspidate pubescent longer. Bracteoles linear narrowed acute shorter than the flowers. Calyx tube one inch long narrow little enlarged above, lobes lanceolate acute quite covered with silky hairs. Corolla tube hairy but little longer, lobes narrow acute. Lip oblong rounded hairy. Anther oblong hairy. Capsule an inch long obovate warty covered with brown wool.

Celebes.

Another species of this grand Eastern island genus, allied to Miquel's *T. pungens* but with larger flowers and pubescent bracts. I have great pleasure in associating it with the name of Dr. Koorders, who made such fine collections of plants in Celebes recently.

### The Birds of the Larut Hills.

Two birds mentioned, but not named, in my paper on the Birds of the Larut Hills have been identified for me by Dr. Hartert.

They are :

*Aethopyga temminckii*, Temminck's Honeysucker. The second species of scarlet honeysucker mentioned on p. 21.

*Notodela leucura*. The White-tailed Blue Robin, a female. The "small robin-like brown bird" alluded to at the foot of p. 30.

*A. L. Butler.*

### Botanical Notes.

*Malayan Gingers*. Dr. K. Schumann has published this year in Engler's Jahrbuch Vol. 27, a monograph of the *Scitamineæ* collected in the various islands of the archipelago, by Beccari, in Sarawak, Sumatra and New Guinea, by the brothers Sarasin in

Celebes, and by Warburg, Hollrung and others in New Guinea. In his arrangement he adheres to the old classification including *Hornstedtia*, *Plagiostachys*, etc., under *Amomum*, and so on. One new genus he describes under the name *Haplochorema* seems to be a true *Koempereria* with creeping rhizomes. It occurs in Borneo, four kinds being described from Sarawak. One might describe it as a *Koempereria* adapted for jungle life. *Hedychium microchitum* described from Java in my paper in the last Journal, appears as *Brachychilus Horsfieldii* Peters. It was originally described under the name of *Hedychium Horsfieldii* in Hooker's Kew Miscellany, and also by Peters in a Copenhagen Botanical Journal, both works difficult to procure. The whole habit of the plant is so much that of *Hedychium*, that I think it would be better to keep it in that genus. A good figure of what is evidently the common *Costus globosus* Bl is given under the name of *C. acanthocephalus* n. sp. It was collected in West Sumatra by Beccari. The plant is evidently widely distributed. The whole monograph is interesting from a geographical point of view, for though of course one may be sure that many more of these plants will be found in the Eastern islands, it gives sufficiently clear evidence of the change in the flora as we go further east. Thus one notices that the *Globas*, so abundant here, disappear to a large extent, few occurring in Borneo, fewer in Java, and only one (excluding *G. marantina* probably introduced) further east in the Philippines. *Gastrochilus*, except the cultivated *G. parduratus*, does not occur in the list; but probably this is due to the difficulty of getting the flowers in wild plants. *Zingiber* also disappears rapidly towards the East, but one kind has been met with in New Guinea. *Topeinocheilus* appears to be abundant in the Papuan region, fourteen species of these grand plants being catalogued, extending from Amboina to New Guinea.

*Alpinia rosella* Ridl. Since publishing this species (Journal 32, p. 164) I have found a figure and description of a plant collected in British North Borneo by Burbidge and published under the name *Alpinia Fraseriana* Oliver, in the *Icones Plantarum* vol. vi, pl. 1567, which agrees closely with *A. rosella*, and is I think the same species. I also note some misprints in my description on p. 163, in line 2 *absent* should be *about*, and in line 10 the words should run " Seeds 3 about  $\frac{1}{4}$  inch through.

*Susu Rimau.* In Journal No. 22, on page 340, I gave some account of the curious vegetable product known to the Malays as Susu Rimau, the sclerotium or resting stage of some species of *Polyporus*. I have since obtained other fine specimens of the tuber and the fully developed fungus attached in Singapore and Penang, and Mr. Massee, of Kew, has identified it as *Polyporus sacer*, a very widely distributed fungus.

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### A Pulau Tiuman Superstition.

I visited the Pahang island of Tiuman in 1898 and stumbled across a superstition which did not impress me very much at the time, though it was recalled to my memory by hearing later of an almost identical belief concerning a hill in upper Siam.

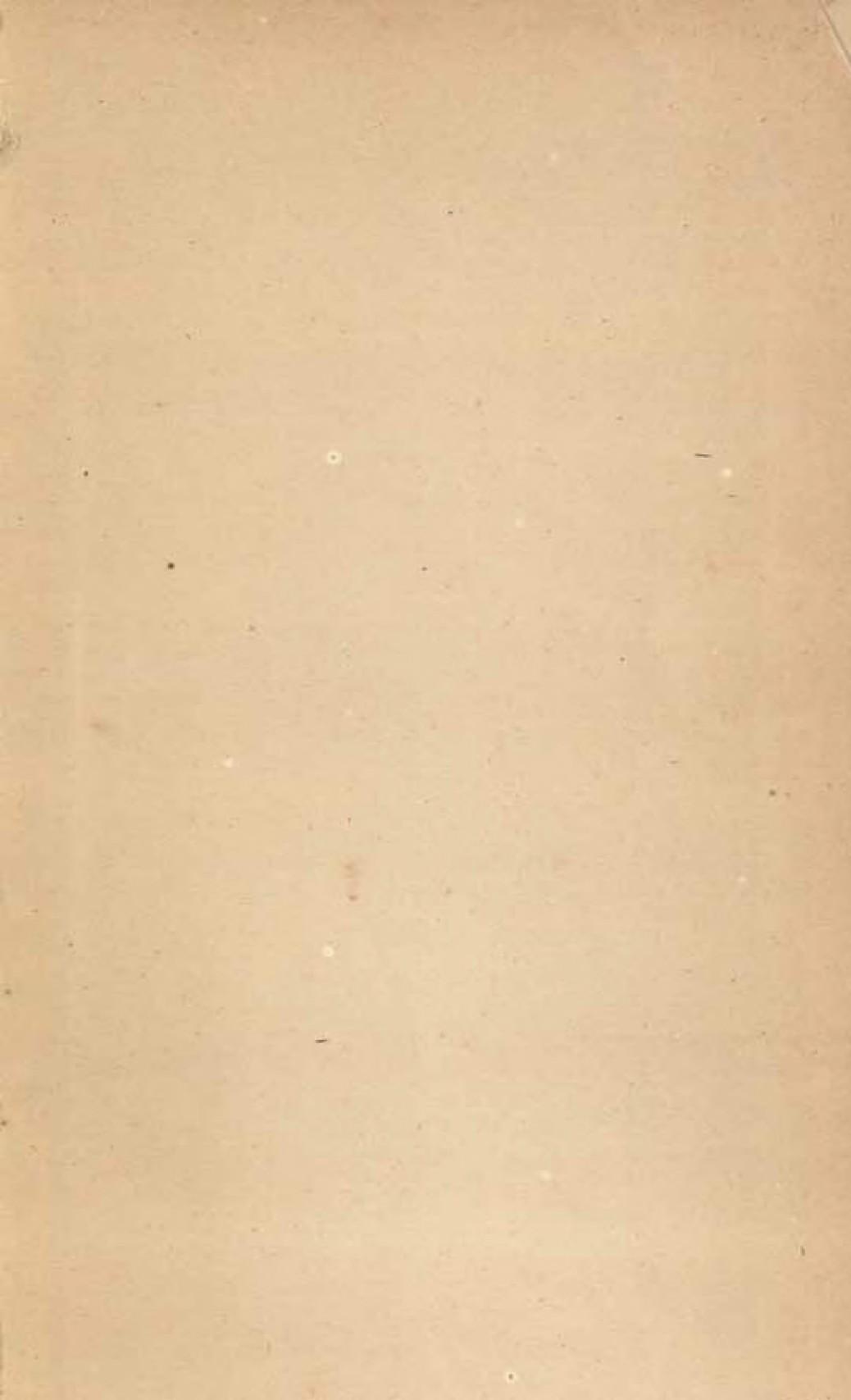
Shortly after going ashore at the island the headman requested me to prevent my Chinese cook bringing any vinegar off the boat; he informed me that if by any chance the vinegar should be spilt, the island would be convulsed and a terrible storm result. On an occasion a few years previously the cook of an European prospector at work on the island had by a similar accident raised such a typhoon that, to quote my informant "the sea was invisible for five days."

This superstition is evidently connected with the widespread belief that no dragon can face vinegar, for it was told me in the village under the peculiar double spur of hill at the extreme south of the island called "Chula Naga" (Dragon's Horns), and it has peculiar application in this instance, though dragons are accredited to several other mountains on the peninsula.

W. C.



AK-AH



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*"A book that is shut is but a block"*

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